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THE DEVELOPMENT AND TESTING OF A SCALE TO IDENTIFY MALE DROPOUTS AT LIBERAL ARTS COLLEGES.

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TWO FORMS OF A SCALE FOR THE COLLEGE INTEREST INVENTORY THAT WERE INTENDED TO IDENTIFY MALE STUDENTS WHO WOULD DROP OUT OF LIBERAL ARTS COLLEGES WERE DEVELOPED AND TESTED. THE PREDICTIVE VALIDITY OF THE SCALES WAS EVALUATED BY COMPARISON WITH THE "SO," "SC," AND "AC" SCALES OF THE CALIFORNIA PSYCHOLOGICAL INVENTORY THAT HAVE BEEN USED TO PREDICT DROPOUTS AT THE 5-PERCENT LEVEL OF CONFIDENCE. THE STUDY SAMPLE CONSISTED OF 45 FIRST-SEMESTER DROPOUTS AND 65 SECOND-SEMESTER DROPOUTS FROM A GROUP OF 1,260 FRESHMEN IN NINE NEW ENGLAND COLLEGES, AND AN EQUAL NUMBER OF STAY-INS SELECTED AT RANDOM. THESE STUDENTS HAD TAKEN BOTH THE COLLEGE INTEREST INVENTORY AND CALIFORNIA PSYCHOLOGICAL INVENTORY. A STATISTICAL ANALYSIS WAS MADE TO IDENTIFY ITEMS THAT DISCRIMINATED BETWEEN THE SUBJECTS WHO WERE DROPOUTS AND THOSE WHO STAYED IN. TWO NEW SCALES WERE COMPOSED. A ".01 LEVEL SCALE" INCLUDED ITEMS OF .10, .05, AND .01 LEVELS OF CONFIDENCE, AND A ".05 LEVEL SCALE" INCLUDED ITEMS OF .05 AND .01 LEVELS ONLY. MEAN SCORES OF BOTH SCALES WERE COMPUTED FOR BOTH THE STAY-INS AND THE DROPOUTS. BOTH SCALES GAVE DIFFERENCES AT THE .05 LEVEL FOR THE 45-MEMBER GROUP. WHEN SCORED AGAINST THE 65-MEMBER GROUP, ONLY THE ".05 LEVEL SCALE" GAVE DIFFERENCES BETWEEN STAY-INS AND DROPOUTS AT THE .05 LEVEL. FROM THE RESULTS OF THE STUDY THE INVESTIGATOR CONCLUDED THAT THE COLLEGE INTEREST INVENTORY AND ADDITIONAL SCALES DEVELOPED WERE OF LIMITED USE IN PREDICTING DROPOUTS, AND SUGGESTED THAT THE CRITERION FOR DROPOUTS SHOULD BE REDEFINED TO EXCLUDE THOSE "FORCED OUT" BY ACADEMIC DEFICIENCES. (AL)

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Boston College

Chestnut Hill, Massachusetts

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CHAPTER I

INTRODUCTION

Why do approximately half the students attending American colleges leave before they attain the baccalaureate degree? There is currently an increasing interest in this question although research on college student dropouts has a history of at least forty years. As the impact of World War II "population explosion" is beginning to be felt on most college campuses and with the recent legislation which enacted the "Cold War G.I. Bill", and the various Education Acts, the number of applicants seeking admission to college continues to rise. It has become imperative therefore that some reasonably effective means be found for predicting which students will successfully complete their college education.

A review of the literature to be cited later in this study indicates that there is a complex of reasons which contribute to a student's decision to withdraw from college. Much of the research thus far done on the subject has measured reading ability, intelligence, aptitude and achievement, all of which undoubtedly do contribute to the student's decision to withdraw from school. However, these studies have been oriented toward predicting which students will successfully complete their college education, not those who will, for some reason or other, decide to withdraw from college. It is in this area that this study will concentrate.

Stern, Stein and Bloom (1956) recognized that there were other factors than intelligence test scores and reading test scores which influence the ability to predict scholastic achievement, while still accepting the general assumption that much of the variance of scholastic achievement can be a function of such scores.

In their book, Methods of Personality Assessment, Stern, Stein and Bloom point out that while success in scholastic forecasting can be attributed to measures of intelligence, achievement and aptitude, there are still some students who fail to remain in college despite being rated highly on these intellectual variables. The authors suggest that areas such as motivation, emotional adjustment, interpersonal relations and interests would bear investigation.

The increasing interest in higher education by the general public and the many recent studies of these institutions of higher learning have emphasized the need for more comprehensive information about the typical college student and about the variation in students or student bodies among the various institutions. Both students and administrators want to know how well the students will do at College X. It is the purpose of this study to help both of these groups do this.

One of the most cogent contributions which can be made in any study of the dropout problem, either at the college or the high school level, is for the educational administrators of any institution to become aware of the nature of the problem. At the college level, the greatest number of dropouts occur during the first two years, with the freshman year being considered the more serious of the two. Therefore, it is incumbent upon the administration to provide the opportunity for major emphasis in combatting this problem virtually from the first day the potential dropout enters the college.

Undoubtedly there are many potentially successful students who do poorly in college or, more important to the purpose of this study, drop out for reasons not related to academic intelligence or aptitude. If more adequate instruments were developed and included in the orientation battery, it would be possible for administrators and psychologists to identify those students who had good potential but who would leave school. With this information, appropriate counseling could be undertaken which would increase the possibility of the student remaining in school. Furthermore, if such instruments could be included in the screening battery utilized by many institutions, they would be of considerable assistance in helping to determine those to be admitted.

Earlier studies of college students by Learned and Wood (1938), McConnell and Heist (1962), Astin (1964), and others indicate clearly that the American college student comes from just about every possible background. Studies such as the above reveal great differences in educational and vocational goals, attitudes, values, potentialities for academic work and interest. Astin's (1964) report, Who Goes Where to College is perhaps the first attempt to objectively and systematically put this new knowledge into a comprehensive form to be used by students and administrators alike.

The college admissions officer shares, with his academic colleagues, a responsibility to the student for promoting educational and psychological growth. The contribution is usually made through the admission process itself. By carefully assessing the potential of the applicants, the admissions officer can frequently advise and/or select students who indicate potential for obtaining a degree. Similarly, as it is hoped this study will show, he can become aware of those students who may not persevere in their studies until they obtain a degree. The communication of a student's unique potential to his teachers, and the communication of a student's special needs and problems to student personnel workers illustrate this opportunity which is provided the admissions officer.

If the admissions officer feels that he can provide only data about academic potential to the faculty and members of student personnel services then his outlook is too narrow. He is missing an opportunity to provide a service to the student and the institution in the form of other data available for counseling and advisement purposes which may help keep the potential dropout in school.

Are there instruments available which differentiate between those students who will remain in college and those who will drop out? Yes, to a limited extent.

Studies by Astin (1964) and Staight (1961) which utilized the California Psychological Inventory (1957) indicate that certain scales on that instrument do differentiate between those students who remain in college and those who drop out. Astin found that the scales for Self-Control (Sc); Flexibility (Fx); Femininity (Fe); and Achievement through Conformance (Ac) were significant. Staight found significant differerences in the Achievement through Independence (Ai) and Socialization (So) scales. Cottle with his College Interest Inventory is attempting to produce an instrument which will be useful in predicting dropouts. The relationships between Ac, Sc, and So Scales, found significant at the .01 level in the studies cited above, and the items which contribute to a Drop-out Scale of the Cottle instrument will be investigated.

Statement of the Problem

To what extent does the College Interest Inventory discriminate between those students who remain in college and those who drop out of college? Is there a relationship between the proposed dropout scale or scales of the College Interest Inventory and the Ac, Sc, and So scales of the California Psychological Inventory in predicting college dropouts? Can these instruments be combined to identify potential dropouts?

For the purpose of this study, a dropout is an individual who has formally enrolled in an institution of higher learning and who, for some reason or other, but excluding disciplinary reasons, leaves the institution during his freshman year. (Some may ultimately return, but that possibility is not within the scope of this study.)

The Ac Scale (achievement through conformance) of the California Psychological Inventory is designed to identify those factors of interest and motivation which facilitate achievement in any setting where conformance is a positive behavior.

The Sc Scale (self-control) of the California Psychological Inventory has as its purpose the assessment of degree and adequacy of self-regulation and self-control and freedom from impulsivity and self-centeredness.

The So Scale (socialization) of the California Psychological Inventory is designed to indicate the degree of social maturity, integrity, and rectitude which the individual has attained.

Hypotheses

The purpose of this study is to identify and validate items of the College Interest Inventory which could be used as a scale to predict college male dropouts.

In addition, to determine the relationship between this scale or scales and certain scales of the California Psychological Inventory (Ac, Sc, and So Scales) which have proven significant at the .01 level of probability in previous research. The following hypotheses are therefore proposed:

1. There is no relationship between the Ac Scale of the California Psychological Inventory and the proposed scale or scales of the College Interest Inventory.

2. There is no relationship between the Sc scale of the California Psychological Inventory and the proposed scale or scales of the College Interest Inventory.

3. There is no relationship between the So scale of the California Psychological Inventory and the proposed scale or scales of the College Interest Inventory.

4. There is no discrimination between those students enrolled in a liberal arts curriculum who remain in college and those who drop out of college when the developed dropout scale for the College Interest Inventory is used.

CHAPTER II

REVIEW OF RELATED LITERATURE

The rate at which students drop out of college has been carefully computed for individual institutions and for nationwide samples. However, there are gaps in this information which can be very misleading. Many colleges do not publish attrition figures. Furthermore, there are almost as many different definitions for the "attrition rate" as there are for the word "education." This rate has been computed for one semester, one year, two years, four years, withdrawn-but returned later. In other words, there appears to be a complete lack of unanimity on the type of information we are trying to obtain. To compound the situation there is also a definite lack of agreement on what constitutes a dropout.

Just what is a dropout? For the purpose of this study, a dropout is an individual who has formally enrolled in an institution of higher learning and who, for some reason other than disciplinary, leaves the institution before completing the requirements for a baccalaureate degree. Searching for and evaluating literature which confines itself to the limits of this definition is extremely difficult since most of the literature and research fails to clearly delineate the use of the term, dropout.

By utilizing the classification system of Marsh (1966) the literature can be conveniently classified into three principal categories: (a) Philosophical and Theoretical; (b) Descriptive; and (c) Predictive. Philosophical and theoretical aspects are those suggesting plans of attack which appear worthy of consideration. Descriptive aspects are those which attempt to describe the student, the resources he brings to college, his milieu while on campus, and his reasons for leaving the campus as he perceives them. Predictive studies are those which use correlations of test scores on various tests to point out the dropout or potential dropout.

Philosophical and Theoretical Studies

As we examine some of the proposals suggested by the various authors we are struck with their impracticality. The idea of raising entrance requirements proposed by Shuman (1956) while certainly valid is a problem not facing most institutions of higher learning. Their entrance levels, depending upon the type of institution being surveyed, while not always as high as they would like, are generally at a level which is acceptable to them. Also, the idea propounded by Skelton (1959) of requiring two years of a foreign language in high school has been integrated into the admissions requirements of most institutions but the dropout rate has not changed.

Coplein (1962) illustrates the need for some kind of national clearing house which would follow the student from one institution of higher learning to another, or to a job. He also feels that a separate study should be performed on those students who drop out voluntarily because of academic probation, social probation, and for disciplinary reasons. Only in this fashion will we get some realistic figures and reasons for dropouts.

Chambers (1961) proposes the two year community college as a proving ground for high school graduates. That this plan has some apparent merit is attested to by the large number of two year community colleges which are springing up across the country. In addition to serving as a screening agent to weed out of the state universities those students without the academic, motivational, or psychological drive required for success, they also provide useful terminal degree programs.

In a study to determine whether the achievement of freshmen students with low predicted grades might be improved by counseling Hendrix (1965) utilized the *Ohio State University Psychological Test*, high school grade average, and a predicted university grade-average. Through the medium of realistic counseling stressing the probable difficulties to be encountered, the need to avoid excessive course loads, the experimental group was found to have achieved better during the fall semester than did the control groups. One of the variables which was apparently of great importance was the fact that the experimental groups only averaged 14.40 hours per semester while the control group took 15.60 hours on the average per semester. The differences in the grade averages between the groups were significant at the .99 level of confidence in favor of the experimental group which had received counseling.

Ford and Urban (1965) discussed the effect that counseling had on students at Penn State which was expanded to include counseling for the parents as well. Results of the personalized counseling which took place indicated that only 10 per cent of the original enrolling students failed to earn some kind of a degree eventually, despite the fact that 40 per cent dropped out at sometime during their course of study.

Another study in the same vein was that performed by Pervin (1965) who compared dropouts from three Princeton classes, 1940, 1951, and 1960 with non-dropouts from the same classes, seeking to ascertain the post-college effects of withdrawal. This study showed that the number of dropouts who returned to college was 50 per cent for the class of 1940, 82 per cent for the class of 1951, and 97 per cent for the class of 1960. The percentages of these former dropouts who eventually graduated were 53, 74 and 88 per cent, respectively.

In another study which sought to ascertain whether or not students who were academically deficient at the end of the first semester should be allowed to remain in school, Folsom and Warren (1964) reported that only one of twenty-eight students recovered sufficiently to be enabled to continue in school. The result led Sacramento State to disqualify all students who exceeded the deficit limits immediately after the fall semester.

In an attempt to keep prospective dropouts in college, The University of Oregon conducted one-day summer orientation programs of group meetings and individual interviews. In reporting on this study, Carlson and Wegner (1965) state that of the four groups utilized, all were essentially equivalent in predicted GPA, in attained GPA for the fall semester, and in college adjustment. While the withdrawal rate of those attending the summer orientation was lower than that of the other groups the difference was not statistically significant.

In a study reported in 1962, Baker and McClintock utilized an early failure exponential curve borrowed from industry to successfully predict early college failures.

We must keep in mind however that the individual does not become a dropout merely because he lacks intelligence. Today the withdrawing student is plagued by a complexity of reasons, at least in his eyes, that is acting upon him from every possible angle, intellectually, emotionally, psychologically, and even morally. We will examine in the next few pages some of these exterior pressures which all too often become so internalized that they force withdrawal.

Jex and Merrill (1962) did a study in persistence at the University of Utah. This report stresses the need for longitudinal studies of the problem and cites numerous studies performed at that institution, several of which indicate that, especially since World War II, there has been a shift at that University from "dropout" to "interruption" of academic goals. Studies at Utah performed on the freshman class of engineering students of 1948 show that of 156 students who enrolled only 25 had graduated in 1952, 53 by 1953, but that 114 or 73 per cent of the original 156 enrolled had graduated by 1959, eleven years later. Of the total class of 1,643 entering in 1948, 52 per cent of the males and 34 per cent of the females had graduated by 1961. It is anticipated that as many as 60 per cent of this class will graduate eventually.

While each of the above cited studies considers suggested plans of attack to remedy the dropout situation and each has undoubtedly had its own adherents, it is the purpose of this study to demonstrate that the solution may be vested in the development and validation of ways to identify potential dropouts, such as the dropout scale for the College Interest Inventory so that remedial action may be taken. There is at present no known inventory or self-evaluative instrument which predicts dropouts at the college level similar to the one used here. Certain scales of the California Psychological Inventory (Astin 1964, Staight 1961) do however predict significantly. There have been scales developed to identify the potential non-achiever. Munroe (1945) was able to report correlations between attrition and test scores on a modification of the Rorschach method. Gilmore, as cited in Sanford (1962) used Sentence Completion tests as a prediction of college achievement. Webster (1956) utilizing a developmental scale failed to find significant differences. Cottle (1962), Epps and Cottle (1958), and Hermann and Cottle (1958) report on the development and validation of a dropout scale and certain other scales of the School Interest Inventory. This is an instrument designed for the junior high school student.

While this study is interested in identifying those students who probably will be considered poor risks or prone to be dropouts, there will be no attempt to utilize such variables as grade point averages, high school grades or high school rank in class. Rather, it is hoped that this identification of dropouts will be ascertained through the development of a special dropout scale or scales on the College Interest Inventory. If this is possible and such scales are developed, it will be of invaluable assistance both to admissions personnel and to counselors.

Descriptive Studies

There have been three major studies on attrition during the past thirty years. McNeeley (1937) on a sample of 12,667 students at 149 institutions found that only 39.5 per cent graduated in four years. Iffert (1957) by extrapolation arrived at a rough estimate of 59 per cent as the maximum percentage eventually graduating. Summerskill (1955) in a review of thirty-five different studies covering the period 1913 - 1955 found that attrition rates had not changed appreciably over that period, ranging from 49 per cent to 53 per cent, although variability in attrition rates among colleges ranged from 12 per cent to 82 per cent in these same studies.

Cowhig (1963) in a study of 1,162,000 persons between the ages of 16 and 24 who attended college in October 1959 but did not graduate, determined six reasons which appear to be of most importance to the dropout. For males, the following reasons and percentages were obtained: lacked money - 27.6 per cent; took job - 21.5 per cent; lost interest - 15.4 per cent; miscellaneous - 13.8 per cent; military service - 8.9 per cent; marriage - 6.9 per cent; poor grades - 5.5 per cent. Females leave school for the same reasons but at a much different ratio: marriage - 35.1 per cent; taking job - 20.5 per cent; loss of interest - 14.6 per cent; and lack of money - 11.1 per cent account for the stated reasons for withdrawal in 86 per cent of the cases. Poor grades do not appear to be a particularly important factor for either male or female students. With the funds presently available under the provisions of the National Defense Education Act lack of money would no longer appear to be a cogent reason for a student to leave school. Seeking employment and loss of interest account for over one third of all dropouts, both male and female. Thus it seems that there is little difference in reasons given why high school students and college students decide to leave school.

Eckland (1964) in reporting on longitudinal studies performed at Vanderbilt University and the University of Illinois indicated that around 50 per cent of the dropouts returned to graduate at a later date, some as much as ten years later. In direct opposition to the study of Cowhig, he states that among all dropouts in these studies, marriage, lack of interest and job opportunities were relatively infrequent reasons for withdrawal. Students giving lack of goals or personal problems as reasons for leaving school were most likely to return.

Brown (1961) utilized the Minnesota Counseling Inventory in a study of 3,200 potential dropouts from three liberal arts colleges. Of this group 79 did drop out. The MCI profile of the dropouts indicated personality differences between the dropouts and the stay-ins, male dropouts tending to score high on scales purporting to measure irresponsibility and non-conformance.

Astin (1964) utilizing the California Psychological Inventory, found that students who drop out of college come from lower socio-economic backgrounds, have lower high school marks, plan initially to get lower college degrees and apply for fewer scholarships than students who do not drop out. Results of the CPI for males suggest that dropouts tend to be more aloof, more self-centered, more impulsive and more assertive than do stay-ins. Scales of the CPI significant at the .05 probability level and beyond were Self Control; Flexibility; Femininity; Achievement through conformance.

McFee (1961) found that personality characteristics of students varied widely from one college to another and between colleges of the same type and general educational classification. Her study of the interaction between students and their environment utilized the College Characteristics Index and Activities Index developed by Pace and Stern. She failed to find a correlation between scale scores of the two instruments. Also, there was no strong relationship found between personality needs and students' perceptions of environmental press.

Barger and Hall (1965) attempted to establish a relationship between those students who dropped out of school early and those who left late in the trimester, utilizing a questionnaire. There were differences in response with the late withdrawals making more recuperative attempts to return, and twice as many late withdrawals as early withdrawals had specific work plans.

In a study of dropouts at the University of North Carolina, Curtis and Curtis (1965) utilizing a questionnaire survey of 1200 undergraduate and graduate students determined that there was little difference between problems of dropouts and problems of students who remained in school. Those remaining indicated fewer emotional problems, less concern over academic achievement, and a greater interest in extra-curricular activities.

Levenson (1965) reports on a study performed at the William Alanson White Institute in which 101 students from 38 colleges, with a median IQ of 125, were interviewed by psychiatrists. These students had withdrawn from college but were considered capable of college work, one third of them having superior grades at the time of withdrawing. Although finances were important in some cases, emotional problems were important in every case. The students demonstrated lack of perseverance, had poor study habits, showed poor judgment, lacked a sense of proportion and were poorly organized in their work. They were negative toward authority, lacked trust in others, and had interpersonal problems. The dropouts, as reported in this study, are essentially unhappy, confused, and trying to cope with debilitating family problems.

In a study at a large Mid-west state university, Heilbrun (1965) tested the entire freshman class with a personality test and an academic aptitude test. He found that dropouts were more assertive, less task-oriented, but only for those individuals with high ability level.

Barger and Hall (1965) utilized academic aptitude and social class in a study of 2,348 men and 1,296 women freshmen at the University of Florida. The father's education was directly related to aptitude. For both men and women in the upper third of the aptitude distribution, withdrawal was more common among students from broken homes. Thus, social class and aptitude seem to interact in their effects on college achievement and persistence.

In another study at the University of Florida, Chambers, Barger and Lieberman (1965) found that on a sample of 500 freshmen, aptitude scores accounted for most of the differences between dropouts and survivors with verbal scores more discriminating than quantitative scores. A projective measure of student needs improved discrimination between the groups somewhat with the dropouts appearing more aggressive, more resistant to authority, and more troubled over sexual adjustment.

All of the descriptive studies cited have attempted to describe the dropout in terms of what he brings to college, how he lives and behaves while on campus, and his reasons for leaving college as he perceives them. This study is designed to develop a scoring scale which can be used with the College Interest Inventory and which will have sufficient discriminating power to identify the potential dropout or early school leaver either while he is still in school, or more profitably, before he is admitted to school. The useable inventory would measure linguistic-nonlinguistic ability, achievement potential, and dropout probability. Whether or not this inventory does these things to the satisfaction of all will be determined by the results.

The above studies contain certain implications for our culture which can be quite important. There appears to be a need for modification in student personnel programs to accommodate "interrupted," "working," adult or "aging" students; a need to create programs at varying hours to accommodate those individuals who cannot attend classes scheduled on an 8:00 A.M. - 5:00 P.M. basis; a recognition that college education may center around behavior of adults returning to school as well as adolescents preparing for life. With the increased leisure that appears to be developing for the work force of the nation, it seems inevitable that there will be a greatly increased demand for education of adults. In this same vein, industry appears to be placing ever increasing emphasis on education as a basic part of career development and thus may be forcing working adults back to school. The question remains as to whether our colleges and universities can adapt to this changing requirement.

Predictive Studies

Munger (1954) with a sample of 891 students utilized psychological tests, reading tests, survey of study habits, adjustment inventory and grades received in the first semester in college in an attempt to find significant relationships between the scores achieved on these tests and persistence in college. He came to the conclusion that first semester grades appear to be the best source of information for counselors to use in working with potential dropouts.

In another study performed at a large mid-western university, Fults and Taylor (1959) studied 2,462 students by utilizing test results from the ACE, Co-op Reading Test, and Co-op English Test. The resultant findings indicated that the dropouts from this group scored lower on the standardized tests than did those who stayed-in although there was no significant difference between the two groups on the academic grades they achieved while both groups were in college.

At the University of Georgia in a study to explore the practicality of multiple prediction, aptitude and achievement data for 759 males were studied by Irvine (1965). These data were to be utilized in predicting graduation from college within five years of admission. Scores used were SAT scores, position in high school graduation class, high school averages, and number of high school units earned in mathematics, science, social studies, foreign languages, and English. While high school average, high school rank, and SAT-M scores contributed most to prediction of graduation, their multiple correlation with graduation was less than 0.48. Adding other variables to the prediction equation did little to increase the accuracy of the prediction.

Righthand (1965) in a study to identify technical institute dropouts, found that the mathematics scores of the Engineering and Physical Science Aptitude Test and the Survey of Study Habits and Attitudes discriminated between stay-ins and dropouts. The Allport-Vernon-Lindzey Study of Values and the Henmon-Nelson Test of Mental Maturity did not.

In a different sort of approach to predicting persistence in college, Prediger (1965) utilized a biographical inventory but found that it added little to aptitude scores and previous achievement in predicting persistence among college men. His sample of 1,710 students from the University of Missouri revealed that the best predictors of continued success in college were ability and achievement measures.

In a study reported in the Journal of Educational Research, Vorreyer (1963) examined the relationship of selected adjustment factors such as the home, health, social, emotional and scholastic achievement for those students who remained in college and those who dropped out, in an attempt to arrive at an equation which would predict potential dropouts. His study was conducted at a Rocky Mountain university on a sample of 732. Vorreyer utilized some of the same instruments that Munger (1954) had used, the Ohio State Psychological Examination, and the Bell Adjustment Inventory. He also took into consideration high school cumulative grade average and college freshman grade average. His findings indicate that there are certain clusters of characteristics which make it possible to identify those students who terminate schooling before graduation as well as those who complete their studies. In the equation which he derived he found a degree of effectiveness in identifying potential dropouts, both male and female, to enable them to be used by trained student personnel workers in the parent institutions. It was also found that no single item of information available for freshmen students affords an adequate index to identify potential dropout students. However, he felt that a constellation of selected traits and qualities could be determined which would be of assistance in curtailing student mortality from dropouts.

Miscellaneous Studies

Since the dropout problem is one with national implications, it must be viewed in the total social and economic context. Motivation and intellectual curiosity can be stifled by poverty. Whether the anti-poverty law of President Johnson will be able to make any change is highly debatable, for the effects of cultural deprivation are apparent before the child reaches school age. Sofokidis and Sullivan (1964) in commenting on this fact point up their findings that young people from poverty-stricken backgrounds are surrounded by other disadvantaged people, many of whom are unemployed or intermittently employed at low wages. Racial discrimination is also a barrier to economic and social advances for a large segment of the poor although the Civil Rights legislation of 1963 and 1964 may alleviate this situation. Having such environmental determinants, it can be seen readily why college freshmen, those few who enter college from such surrounding, are all too easily dissuaded from staying in school.

While this study is primarily concerned with the college dropout there is a growing concern on the part of educators at all levels to look critically at the national implications of the problem. Bayley (1964) indicates that there is definite parallelism between dropouts at the high school level and those at the college level. More than thirty per cent of students drop out of high school before finishing, while forty-eight percent of college students fail to graduate. There is also a number of other factors which appear at both the high school and college level. In both instances, the dropout takes no part in school activities, sports, clubs, papers, and such other extra-curricular activities. He does not have very many friends in school. There are three times as many poor readers as good readers, and there are certain familial patterns which recur. In an Iowa study of high school dropouts, Neisser (1963) states that seventy-nine percent of the fathers of dropout students had also been dropouts.

In 1963, the late President Kennedy appealed to clergymen and others in the community to help out in this grave social problem. There is a growing feeling in this day of automation that there is no place left for the untrained. Dropouts, regardless of the level, create a huge loss in human resources and place a limitation on the economy's growth capacity as well as contributing to the general rise in unemployment.

That there is a demand for brainpower in our world of today is well known, but a fact which is not apparently as well known but which is discussed by Hoyt (1962) in reporting on a study of high school dropouts in Iowa, is that the student with an IQ of 120 drops out of school at approximately the same rate as all dropouts, regardless of intelligence. This then leads us to the proposition that there are many other factors, besides intelligence, which enter into the dropout picture, a position taken by many of the researchers whom we have examined in this paper.

There is definite lack on the part of most colleges and universities to study clinically the causes of student mortality. This failure denies to administrative officers and faculties vital information which could be used to examine more critically both the successful student and the dropout. This then reiterates a statement made earlier in this paper. The administration must be aware of the nature of the problem. However, to be aware of the nature of the problem also means that the institution must identify its own goals. Various studies cited by Summerskill in The American College (Sanford ed. 1962) indicate that in many cases this is not the situation, and that environment, pressure, and motivation all require study since it is recognized that these affect the students and in turn their conduct.

Studies already completed indicate quite conclusively that the causes for dropping out of school are multitudinous. It must also be realized that these are an interactive complex of causes with different values for different individuals which produce dropouts. Causes which are primary and those which are secondary in importance should be pinpointed and it should be realized that in many cases it is the sheer multiplicity of causes which have a cumulative effect and consequently force the student into withdrawal.

Since all causes of dropout are not equal in weight and each dropout is an individual, it is incumbent upon the researcher to delineate between causes and outcomes and be acceptant of the fact that for some students withdrawal achieves certain desirable goals. It is for this reason that a need exists for a follow-up of the students who withdraw. Perhaps some of them at least are now attaining the aims and goals which they could not attain in college.

As mentioned by Summerskill in The American College (Sanford, ed. 1962) and also by innumerable authors on other occasions, it is not enough to assume reliability and validity of data just because the studies are performed by professionals. Too often research of this type is performed through other than empirical means.

If research is to have meaning, it must be both reliable and valid. It is hoped that the findings of this study will have both validity and reliability and will be useful for research in other liberal arts colleges in the country.

CHAPTER III

DESIGN OF THE STUDY

Description of the Sample

The total sample for this research was 1260 male students enrolled in liberal arts curricula at nine New England institutions. These nine institutions have a total enrollment in excess of forty thousand students when all colleges within the university systems are considered. The smallest school represented has an enrollment of less than five hundred, the largest in excess of twelve thousand. Despite the large disparity within the size of the student bodies involved, it is felt that this research will indicate that there are certain patterns of responses which evolve which are applicable to male liberal arts students wherever they may be enrolled within the New England portion of the United States.

In interviews with Deans, Registrars, or Admissions Officers of the colleges taking part in the study, the writer attempted to determine the academic pressures extant at each institution. This information, where obtainable, has been incorporated into the brief description of the cooperating institutions which follow.

College Number 1 is an urban Roman Catholic institution with a student body less than one thousand. It is co-educational and provides an educational experience permeated by French academic and cultural tradition. It caters to the young man of "strong average ability". About half of all those who apply for admission are accepted, with 35 per cent of those admitted having graduated in the top quarter of their high school class. Although the college seeks a national student body, one half are from New England, one third from the Middle Atlantic states. Although 70 per cent of the graduates go on to graduate school, academic pressure does not appear to be severe.

College Number 2, is a private,independent, co-educational institution of less than one thousand students. Although it is located in a rural area, it is within fifteen miles of the state capitol, which is also the largest city in the state. Students who rank in the upper two-thirds of their high school class are admitted with about 65 per cent of all those seeking admission being admitted. Of those admitted, 25 per cent rank in the upper quarter of their high school class, 53 per cent in the top half. About 25 per cent of the graduates go on to graduate school, while only 10 per cent of male students fail to graduate for academic reasons. There is heavy emphasis on Bible study ". . . . College is a Christian College and seeks to integrate its total educational program with the Christian faith". About 50 per cent of the male population live on campus.

College Number 3 is a private, independent, co-educational institution of about one thousand students, in an urban community. It is a strong, academically oriented liberal arts college. About 30 per cent of all applicants are accepted. Of those accepted, 75 per cent of the freshmen rank in the top fifth of their high school class. Pressures for academic achievement appear to be fairly intense. About 75 per cent of the student body comes from New England, and the college does not seek students actively from other areas. There is a fairly full program of cultural activities. While 95 per cent of all males live on campus, only 2-3 per cent fail to graduate for academic reasons.

College Number 4 is a large, urban, Roman Catholic, co-educational institution with an enrollment in excess of eight thousand. It is the major Catholic institution of higher learning in the nation's leading center of higher education -- the Boston-Cambridge area. Admission is highly selective with only about one out of four applicants being accepted. Of those accepted 60 per cent graduate in the top quarter of their high school class, 90 per cent in the upper half. Pressures for academic achievement appear fairly intense, and are increasing. About 75 per cent of male graduates go on to graduate school. About 70 per cent of the students come from the Northeast, 13 per cent from the Midwest, although there are strong attempts being made to nationalize the student body. Only about half the male student body live on campus with the largest portion of the balance commuting to their homes daily. About 12 per cent of males fail to graduate for academic reasons.

College Number 5 is a large, land grant college and state university with a total enrollment of about 10,000, located in a rural area. It is the only publicly supported university in the state. Graduates of accredited high schools can be admitted but only about half of those applying are accepted. Pressures for academic achievement appear moderate. About 80 per cent of the students come from within the state, most of the remainder come from the other states in the Northeast, although half of the fifty states are represented. The university makes no religious demands on the students. A fairly active cultural and intellectual life on campus is provided largely by the students themselves.

College Number 6 is a Roman Catholic, co-educational institution located in a rural area but within twenty-five miles of a large metropolitan area. Applications for admission are accepted from students ranking in the upper half of their high school class, with 48 per cent of applicants being accepted. Of the total student body, 94 per cent are from the Northeast, 4 per cent from the Midwest. 35 per cent of the males graduating go on to graduate studies, while 20 per cent fail to graduate for academic reasons.

College Number 7 is small, under 750 students. It is a rural, liberal arts, co-educational institution. It accepts students in the upper two thirds of their graduating class. It caters to the young person of average ability. It draws its student body primarily from the Northeast and the Midwest, with a strong representation from the Middle Atlantic states. About 20 per cent go on to graduate school, while 25 per cent fail to graduate for academic reasons.

College Number 8 is a private, co-educational college located in in a large urban community and operates the largest cooperative education program in the country. Students who rank in the upper half of their high school graduating class are admitted, with about 48 per cent of the applicants being accepted. All but 2 per cent of the student body comes from the Northeast. Of admitted freshmen, 34 per cent graduated in the top quarter of their high school class, 84 per cent in the top half. Only about 10 per cent of the male student body lives on campus, with the largest part of the balance being commuters. 20 per cent of male graduates go on to graduate study while about 30 per cent fail to graduate for academic reasons.

College Number 9 is a small, (under 500 students), male, liberal arts college located in a rural setting. Students admitted should rank in the upper two thirds of their graduating class, with about 50 per cent of applicants being accepted. The student body is divided almost equally between the Northeast and Middle Atlantic states. About 90 per cent of the students reside on campus with the balance being commuters. Pressures for academic achievement appear to be moderate. About 20 per cent of graduates go on to graduate school, while 23 per cent fail to graduate for academic reasons.

TABLE I

COMPOSITION OF SAMPLE USED IN STUDY

(N = 1260)

College or University	No. Participants
No. 1	187
No. 2	71
No. 3	15 (10 % sample)
No. 4	486
No. 5	41 (10% sample)
No. 6	159
No. 7	125
No. 8	20 (10% sample)
No. 9	156

A ten percent sample was accepted on schools 3, 5, and 8 since it was not possible to include the prescribed testing program into the orientation period. It was therefore necessary to schedule this testing for the indicated institutions during the semester and impossible to obtain all of the freshmen enrolled in the liberal arts curricula.

Instruments Used

This study is part of an attempt to develop an inventory which might identify potential college male dropouts from liberal arts colleges. The successful development of a Dropout Scale for this inventory will permit colleges to undertake a program resulting in the detection of those students who are potential dropouts and the development of a counseling program designed to help them remain in school.

With this in mind a 230-item inventory, *The College Interest Inventory* was developed by Cottle. In the present study this inventory and the *California Psychological Inventory* were administered to 1260 male students from nine colleges and universities. Only those males enrolled in a liberal arts curriculum were tested.

The College Interest Inventory is a questionnaire designed to be administered to entering college freshmen and to have sufficient discriminatory power to predict the potential dropout before he may be aware of this tendency himself. In this manner, preventive measures may be taken which will afford the student a better opportunity to finish his studies.

The California Psychological Inventory is a 480-item, forced choice inventory derived primarily from the *Minnesota Multiphasic Personality Inventory*. It is specifically designed for relatively normal high school and college students.

With the exception of the three schools which could not include the testing during the freshman orientation period, all testing was done during the first week of the school year under the direction of either the Director of Admission or the Director of Counseling. Completed answer sheets were returned to the writer for scoring and analysis.

Treatment of the Data

From the total stay-in group for each institution at random as many stay-ins as dropouts were selected. Then using double, cross-validation techniques, item analyses were performed and phi coefficients were computed to identify items discriminating between stay-ins and dropouts in each of the two samples, those dropping out during the first semester, and those dropping out during or at the end of the second semester. The first group, composed of 45 dropouts and an equal number of stay-ins, is identified as Sample A. The second group, composed of 61 dropouts and an equal number of stay-ins, is identified as Sample B.

Next frequency distributions of scores for those who have remained in school and those who have dropped out of school were prepared. If the developed scales discriminate, there should be limited overlap between the two parts of each sample.

Then a discriminant analysis using the four scale scores was performed; the scores on the Dropout Scales and the three CPI scales, the So, Sc and Ac scales, to heighten whatever differences exist between the dropout and stay-in groups in each sample.

Then product-moment correlational techniques were used to obtain the correlation between the Dropout Scales and the So, Sc and Ac Scales of the *California Psychological Inventory*.

CHAPTER IV

ANALYSIS OF THE DATA

This study was designed for the purpose of developing and validating a scale which might differentiate between freshmen students in a liberal arts curriculum, who dropped out of college and those who remained in college beyond their freshman year.

The first step in the development of the proposed scale or scales was to determine the phi coefficient significant at the .10, .05, and .01 levels.

The following formulas were used to determine phi values significant at the .01, .05, and .10 probability levels according to Guilford (1954) and cited in Cottle and Downie (1960).

$$\text{phi } .01 = \frac{2.576}{\sqrt{90}} = .27$$

$$\text{phi } .05 = \frac{1.960}{\sqrt{90}} = .20$$

$$\text{phi } .10 = \frac{1.645}{\sqrt{90}} = .17$$

Jurgenson's (1947) table of proportions was used to obtain phi coefficients.

These then are the values of the phi coefficient at the three levels which were used to identify items which discriminate between the stay-ins and the dropouts. It was determined to utilize items at the 10 per cent level of probability to preclude the dropping of items which might be of use in further research with the instrument. There were 38 items significant at the 5 per cent level, of these 28 were at the .01 level, and a total of 75 that were significant at least at the 10 per cent level of probability.

In the table of phi coefficients and significance for sample A, shown in Appendix C, an x is used to indicate levels of significance. An item significant at the . 01 level of probability perforce must be significant at the .05 and .10 levels of probability. Similarly, an item significant at the .05 level of probability will be significant at the .10 level.

The next step in handling the data was to prepare frequency distributions for both dropouts and stay-ins while utilizing items at both the .10 level of probability and the .05 level of probability. This frequency distribution of scores is shown in Table 2.

With frequency distributions prepared for both dropouts and stay-ins, the means and standard deviations were next computed for each group with the following results:

TABLE 2

DEVELOPMENTAL SCALE FREQUENCY DISTRIBUTION

SAMPLE A

Score	f .10 Scale	f .05 Scale
DROPOUTS		
38-39	1	0
36-37	3	0
34-35	3	0
32-33	3	2
30-31	7	0
28-29	7	3
26-27	7	6
24-25	8	7
22-23	3	9
20-21	1	7
18-19	1	7
16-17	1	3
14-15	0	1
12-13	0	0
	N = 45	N = 45
STAY-INS		
38-39	1	0
36-37	0	0
34-35	0	0
32-33	1	0
30-31	8	1
28-29	4	0
26-27	10	4
24-25	12	6
22-23	3	6
20-21	3	13
18-19	2	7
16-17	1	5
14-15	0	2
12-13	0	1
	N = 45	N = 45

TABLE 3

MEANS AND STANDARD DEVIATIONS
OF SCALE DEVELOPMENTAL GROUPS

.10 Scale	.05 Scale
DROPOUTS	
$\bar{X}_1 = 28.20$	$\bar{X}_1 = 22.62$
$N_1 = 45$	$N_1 = 45$
$s_1 = 5.43$	$s_1 = 4.06$
STAY-INS	
$\bar{X}_2 = 25.03$	$\bar{X}_2 = 20.77$
$N_2 = 45$	$N_2 = 45$
$s_2 = 4.22$	$s_2 = 3.30$

With the means and standard deviations determined for both groups, utilizing those items found significant at both the .10 and .05 levels of probability for scoring, and a null hypothesis of no difference between the means, it was decided to use the t-test to accept or reject the hypothesis. The t-test is defined as the ratio of the difference between the means divided by the standard error of the difference -

$$t = \frac{\bar{X}_1 - \bar{X}_2}{s_{D_{\bar{X}}}}$$

To test the two variances, it is necessary to make an F-test, which is defined as the larger of the two sample variances divided by the smaller of the two sample variances:

$$F = \frac{s_1^2}{s_2^2}$$

$$F = 1.65$$

With an $F = 1.65$ we have a significant F, and therefore the test of significance between means becomes the Cochran-Cox test, which is found by entering the tables of significance for t with half the usual degrees of freedom.

With the standard error of the difference between the two means of the .10 scale, it is then possible to make the t-test.

$$t = 2.34$$

This figure was found to be significant at the .05 level, utilizing 44 degrees of freedom. Hence the null hypothesis of no difference between the two means is rejected.

The same procedures will be repeated for the .05 scale. However, these data will be shown in table form rather than in the detailed manner depicted above.

TABLE 4

DEVELOPMENTAL GROUP DATA - SAMPLE A

	N	$\bar{X}$	S.D.	Var.	Vmean	$S_{D_{\bar{X}}}$	F	t	d.f.	P.
				.05 Scale						
Dropouts	45	22.62	4.04	16.32	.36	.77	1.50	2.34	88	<.05
Stay-ins	45	20.77	3.30	10.89	.24					

Going to the t-table with 88 degrees of freedom, the .05 probability level is 1.98. Thus the null hypothesis of no difference between the two means is rejected.

In order to test the efficacy of the Sample A scales, a validation group of 130 subjects was used and is shown as Sample B. The group was comprised of 65 dropouts and an equal number of stay-ins selected through the use of a table of random numbers from those schools contributing the 65 dropouts. (Spiegel 1961). The same statistical procedures for F and t ratios were followed that had been used with the group on which the Sample A scale was developed.

TABLE 5

VALIDATION GROUP DATA - SAMPLE B

	N	$\bar{X}$	S.D.	Var.	Vmean	$S_{D_{\bar{X}}}$	F	t	d.f.	P.
				.10 Scale						
Dropouts	65	28.20	4.85	23.52	.36	.75	1.77	1.86	128	>.05
Stay-ins	65	26.82	3.65	13.32	.21					
				.05 Scale						
Dropouts	65	22.46	4.08	16.64	.26	.67	1.37	2.22	128	<.05
Stay-ins	65	20.97	3.55	12.60	.19					

With a t-ratio of 1.86 for the Validation Group (Sample B) when scored against the .10 scale, the null hypothesis of no difference between the means for dropouts and stay-ins fails of rejection.

However, a t-ratio of 2.22 for the Validation Group (Sample B) when scored against the .05 scale rejects the null hypothesis of no difference between the means for dropouts and stay-ins.

Cross Validation

In an attempt to substantiate the above findings and to assess the true value of the .10 level and .05 level scales, cross-validation techniques were utilized. This is the procedure whereby an item analysis is performed and phi coefficients computed to identify items discriminating between stay-ins and drop-outs in Sample B, the group used to cross validate the previously developed scales. The Sample B scales are then scored against the original group of Sample A dropouts and stay-ins, resulting in another cross-validation.

The item analysis from which the scoring keys were prepared, and the resulting phi coefficients, are shown in detail in Appendix D. The first step in the procedure, after completion of scoring, was to prepare a frequency distribution for both dropouts and stay-ins while utilizing items significant at both the .10 level of probability and the .05 level of probability. The obtained frequency distribution is shown in Table 6.

TABLE 6

CROSS VALIDATION SCALE FREQUENCY DISTRIBUTION - SAMPLE B

Score	f .10 Scale	f .05 Scale
	DROPOUTS	
26-27	1	0
24-25	0	0
22-23	0	0
20-21	8	0
18-19	14	0
16-17	12	0
14-15	13	0
12-13	13	0
10-11	4	9
8-9	0	20
6-7	0	25
4-5	0	9
2-3	0	2
	N = 65	N = 65
	STAY-INS	
22-23	1	0
20-21	3	0
18-19	12	0
16-17	16	0
14-15	19	0
12-13	11	2
10-11	1	6
8-9	1	13
6-7	0	33
4-5	0	8
2-3	0	3
	N = 65	N = 65

With frequency distributions prepared for both dropouts and stay-ins, the means and standard deviations were next computed for each group. Then the standard error of the difference and the variance was computed for each group of the samples, F-ratios determined, and t-tests run. These data are presented in Table 7.

TABLE 7

DEVELOPMENTAL GROUP DATA FOR CROSS VALIDATION - SAMPLE B

	N	$\bar{X}$	S.D.	Var.	Vmean	F	t	d.f.	p.
.10 Scale									
Dropouts	65	15.98	3.28	10.73	.17	1.42	.67	128	>.10 N.S.
Stay-ins	65	15.62	2.74	7.49	.12				
.05 Scale									
Dropouts	65	7.20	2.01	4.04	.05	1.20	.85	128	>.10 N.S.
Stay-ins	65	6.92	1.84	3.41	.06				

Neither the .05 nor the .10 scale developed on the B groups were significant in differentiating between dropouts and stay-ins when used with the A groups. The results are shown in Table 8. The scales will differentiate in their original group due to the fact that they were constructed on these groups. However, when the scale developed on the samples of 45 at the .05 level was scored on the samples of 65, it did differentiate between dropouts and stay-ins as shown in Table 5.

TABLE 8

VALIDATION GROUP DATA - SAMPLE A

	N	$\bar{X}$	S.D.	Var.	Vmean	F	t	d.f.	p.
.10 Scale									
Dropouts	45	15.38	3.29	10.74	.24	1.33	.60	88	>.10 N.S.
Stay-ins	45	15.18	3.77	14.24	.32				
.05 Scale									
Dropouts	45	7.09	2.24	5.04	.11	1.03	1.27	88	>.10 N.S.
Stay-ins	45	6.73	2.21	4.88	.11				

Because of the lack of significant results from cross validation techniques, a study was made to isolate those items which would be common to both Sample A and Sample B. An inspection of significant items indicated little communality of items. Therefore a new scale was developed of all items common to both groups, and at any level of significance between .01 and .20. There were only 26 items which met this criterion. Both dropout and stay-in groups in each of the two samples were scored against this scale. A frequency distribution of obtained scores is shown in Table 9.

TABLE 9

FREQUENCY DISTRIBUTION OF SCORES OF 26-ITEM COMMON SCALE

SAMPLE A

Score	f Dropouts	f Stay-ins
16	0	1
15	4	1
14	4	4
13	6	9
12	4	11
11	10	6
10	5	7
9	8	3
8	2	2
7	2	0
6	0	0
5	0	1
	N = 45	N = 45

SAMPLE B

Score	f Dropouts	f Stay-ins
18	1	0
17	0	0
16	2	1
15	5	4
14	12	6
13	17	11
12	11	7
11	8	13
10	4	12
9	1	8
8	2	3
7	0	0
6	1	0
5	1	0
	N = 65	N = 65

An analysis of the Common Item Scale indicates, inasmuch as there were only 26 items in this scale, a possibility that the samples tested came from two entirely different populations in terms of CII responses. This premise will be further investigated with a frequency distribution for all dropouts and all stay-ins which will examine the degree to which the scaled scores overlap. If the developed scales discriminate as they are intended to, there should be limited overlap between the dropout and stay-in groups. This information will be presented in Tables 10 and 12.

TABLE 10

FREQUENCY DISTRIBUTION TO DETERMINE SCALE SCORE OVERLAP BETWEEN DROPOUTS AND STAY-INS

	.10 Scale	
Score	f Dropouts	f Stay-ins
40-41	4	2
38-39	2	1
36-37	3	3
34-35	9	6
32-33	6	7
30-31	19	15
28-29	24	22
26-27	11	16
24-25	20	22
22-23	4	7
20-21	7	7
18-19	1	1
16-17	1	1
	N = 110	N = 110

Although the development of significant scales should show positive discriminant differences between the dropouts and the stay-ins, the value of such discrimination may not be apparent through visual inspection and only by testing for the significance of the difference between the means can this information properly be determined.

TABLE II

MEANS AND STANDARD DEVIATIONS FOR TOTAL GROUPS

	.10 Scale					
	N	$\bar{X}$	S.D.	$S_{D\bar{X}}$	$\bar{z}$	P
Dropouts	110	28.23	4.78	.59	2.95	$<.01$
Stay-ins	110	26.49	3.85			

It will be seen that despite the fact that there is almost complete overlap in the frequency distribution of scores for dropouts and stay-ins, the difference between the means for the two groups is significant at .01 level.

TABLE 12

FREQUENCY DISTRIBUTION TO DETERMINE SCALE SCORE OVERLAP BETWEEN DROPOUTS AND STAY-INS

	.05 Scale	
Score	f Dropouts	f Stay-ins
30-31	9	0
28-29	5	2
26-27	9	9
24-25	21	18
22-23	24	20
20-21	18	21
18-19	14	30
16-17	8	8
14-15	2	0
12-13	0	2
	N = 110	N = 110

TABLE 13

MEANS AND STANDARD DEVIATIONS FOR TOTAL GROUPS

			.05 Scale			
	N	$\bar{X}$	S.D.	$S_{D_{\bar{X}}}$	$\bar{z}$	p
Dropouts	110	22.58	4.02	.50	3.38	<.01
Stay-ins	110	20.89	3.35			

Here again it will be seen that although there is almost complete overlap in the frequency distribution of scores for dropouts and stay-ins, the difference between the means for the two groups is significant at the .01 level.

Development and Validation

With an initial sample containing forty-five dropouts, representing seven of the nine schools taking part in this study, the other institutions reporting no dropouts during the first semester, and an equal number of stay-ins selected by use of a table of random numbers from among those schools contributing dropouts, scales were developed based on item analysis procedures using phi coefficients significant at the .01, .05, and .10 levels of significance. See Appendix C. (Jurgensen, 1947). The scales were constructed using those items significant at the .01 and .05 levels of significance to create the scale referred to as the .05 level scale. Items significant at the .01, .05, and .10 levels were utilized to construct the scale referred to as the .10 level scale. There were 58 items in the .05 level scale and 28 of those were significant at the .01 level. There was a total of 75 items in the .10 level scale including the 58 from the .05 scale and 17 items significant at the .10 level.

The mean for the 45 dropouts when scored against the .10 level scale was 28.20, while the mean for the 45 stay-ins scored against the same scale was 25.93. Statistical procedures, culminating in a t-test, produced a t value of 2.34, which was significant at the .05 level with 88 degrees of freedom. This then indicates that the difference between the two means is significant, and that such a difference could occur by chance only five times out of a hundred.

The same groups of 45 dropouts and stay-ins were then scored against the .05 level scale. The means for the two groups were 22.62 and 20.70, respectively. With a t value of 2.34 the difference between the two means is found to be significant at the .05 level with 88 degrees of freedom. This again indicates that such a difference could occur by chance only five times out of a hundred. This information is shown in Table 4.

It would thus appear that the scales developed to differentiate between dropouts and stay-ins at liberal arts colleges did in fact differentiate at the .05 level of significance, and that both of these developed scales might be of use in predicting those students who would drop out of college during their freshman year.

In order to assess the ability of the developed scales to differentiate consistently between dropouts and stay-ins, a cross validation was made using a group of 130 students, 65 dropouts and 65 stay-ins, with the latter selected through the use of a table of random numbers from the stay-in sample. There was however, a difference between those students utilized in the development of the scales and those used in the cross validation of the scales. The group of 65 dropouts upon whom the scales were to be validated, included students who had failed academically and were thus forced to withdraw from school, while the group of 45 dropouts upon whom the scales had been constructed was made up almost totally of dropouts, and did not include academic withdrawals or " "force-outs". This possibility however had been taken into consideration and the dropout as defined for the purpose of this study is "an individual who has formally enrolled in an institution of higher learning and who, for some reason or other, but excluding disciplinary reasons, leaves the institution during his freshman year".

The mean for the 65 dropouts when scored against the .10 level scale was 28.20, exactly the same as the mean for the 45 dropouts upon whom the scale was developed. However, the mean for the 65 stay-ins was 26.82 as opposed to the mean of 25.93 for the 45 stay-ins of the original developmental group. The difference between the means of the 65 dropouts and 65 stay-ins was 1.38 while that of the developmental group had been 2.27. A resulting t-test of 1.86 did not reach significance at the .05 level. Results are shown in Table 5.

However, when the .05 level scale was used, the mean for the 65 dropouts was 22.46 and for the 65 stay-ins 20.97. This compares with the means for the original groups of 45 which were 22.62 and 20.77, respectively. It can be seen that the differences between the means of the two groups were 1.85 and 1.49, respectively. With a t-ratio of 2.22, the .05 level scale was found to be significant in differentiating between dropouts and stay-ins at the .05 level, with such a difference able to occur by chance only five times in a hundred. For results see Table 5.

Double-Cross Validation

To make the developed scales more valuable as a means of differentiating between dropouts and stay-ins, it was determined to use further cross validation techniques. This involved performing an item analysis and computing phi coefficients to identify items which discriminated between dropouts and stay-ins on the sample of 130, 65 dropouts and 65 stay-ins, referred to above, and is shown in Appendix D. The resulting scales would then be cross validated against the original group of 90, 45 dropouts and 45 stay-ins. Levels of significance for various values of phi are shown below:

Value of ϕ	.11	.14	.17	.23
Level of sign.	.20	.10	.05	.01

There were only 40 items which contributed to the development of the .10 and .05 scales constructed to score the groups of 65 dropouts and 65 stay-ins. Of these 40 items, 18 were significant at the .10 level, 19 at the .05 level and 3 at the .01 level, although all 40 items appear in the .10 level scale. The .20 level was included merely to identify items which were significant at that level. A frequency distribution of scores attained on these cross validation scales developed at both the .10 level and .05 level is shown in Table 6.

The means for the 65 dropouts and 65 stay-ins, using the newly developed scales were 15.98 and 15.62, respectively, on the .10 scale, and 7.20 and 6.92 on the .05 scale. It can be seen that there is no appreciable difference between these means, and t-ratios on both groups were not significant even at the .10 level of probability. This information is shown in Table 7. Fully realising that there was some difference, in fact, between the make up of these two groups, the larger group including a considerable number of academic dropouts, the newly developed scales were then scored, for purposes of cross validation, against the 45 dropouts and 45 stay-ins of the original group. The results are shown in Table 8.

There was no significant difference between the means for dropouts and stay-ins regardless of whether the .10 scale or the .05 scale were used. The t-ratio did not approach significance in either case.

Common Items

As a result of the failure of the cross validation scales to discriminate at any significant level between dropouts and stay-ins, it was determined to ascertain whether or not there were items common to both the original group of dropouts and the cross validation group of dropouts. An inspection revealed that while there was some degree of communality there were considerably fewer items held in common that had been anticipated. It was therefore decided to extract all items common to both groups at levels from .01 to .20, and to construct a common item scale and score the groups of 45 and 65 against this common scale. There were 26 items common to both groups at levels ranging from .01 to .20. A frequency distribution of scores is shown in Table 9.

Degree of Overlap

Since the efficacy of the developed scales would be apparent in the degree to which the scaled scores for dropouts and stay-ins did not overlap, frequency distributions were prepared which examined this degree of overlap between all dropouts and all stay-ins when scored against the .10 level scale and the .05 level scale, respectively. An examination of Tables 10 and 12 indicate that there is a high degree of overlap between dropouts and stay-ins when either scale is used for scoring. However, there does appear to be a slight differentiation in the .05 level scale as 21 per cent of the dropouts attained scores ranging between 26 and 31, while only 10 per cent of the stay-ins attained scores within the same range. There is a definite clustering of scores on this scale for both dropouts and stay-ins in the range of 18-25, with 77 dropouts and 89 stay-ins falling within that range. There is no such discrimination evidenced on the .10 level scale while the same mid-range clustering is apparent.

When the means and standard deviations for the total group of dropouts, N = 110, and the total group of stay-ins, N - 110, were computed for the .10 scale and the .05 scale and tested for the significance of the difference between the means, it was found that for both scales the difference between the means was significant at the .01 level. This information is shown in Tables 11 and 13, respectively.

Discriminant Analysis

Discriminant analysis is a procedure for estimating the position of an individual on a line that best separates groups. This position is obtained as a function of the individual's data. The discriminant function transforms the individual indices to a single discriminant score and that score is then the individual's classification as a member of one of the groups. Another procedure which can be utilized allows the researcher to predict the group membership of individuals on the basis of a set of attributes of those individuals. The analysis which will be used in this study considers the scores obtained by the individual student on the So, Sc, and Ac scales of the California Psychological Inventory and the scales developed by the writer at the .10 level and the .05 level for the College Interest Inventory. Classification will then be made indicating into which of two classes the individual students would fall.

Another facet of this analysis provides for multivariate analysis.

Multivariate analysis is considered to include those statistical procedures involved in analyzing multiple measurements that have been made on a number of individuals. These multiple variates are considered in combination, as systems.

The first step in multivariate analysis is to obtain the sums and sums of squares and cross products for the sample group. This step is necessary before any other analysis can be made. From these summations the deviation sums of squares and cross products matrix, the variance-covariance matrix, and the correlation matrix can be computed.

The deviation sums of squares and cross products matrices are shown in Tables 14 and 15.

The variance-covariance matrices are shown in Tables 16 and 17.

The correlation matrices are shown in Tables 18 and 19.

Since all of the aforementioned matrices are symmetrical, only the upper half will be reported.

TABLE 14

DEVIATION SUMS OF SQUARES AND CROSSPRODUCTS FOR THREE SCALES OF CPI AND .10 SCALE OF CII

	So	Sc	Ac	CII .10
		Stay-ins N = 110		
1	4162.59	2447.55	1478.46	-62.09
2		5816.87	3038.13	-232.75
3			2996.87	7.75
4				1617.49
		Dropouts N - 110		
1	5140.69	2584.35	2071.17	-834.27
2		5993.67	2394.58	-1194.64
3			2991.35	-661.59
4				2491.32

TABLE 15

DEVIATION SUMS OF SQUARES AND CROSSPRODUCTS FOR THREE SCALES OF CPI AND .05 SCALE OF CII

	So	Sc	Ac	CII .05
Stay-ins N - 110				
1	4162.59	2447.55	1478.46	-109.09
2		5816.87	3038.13	-153.95
3			2996.87	140.95
4				1228.69
Dropouts N = 110				
1	5140.69	2594.35	2017.17	-653.67
2		5993.67	2394.58	-948.84
3			2991.35	-379.29
4				1763.42

TABLE 16

VARIANCE-COVARIANCE MATRIX FOR THREE SCALES OF CPI AND .10 SCALE OF CII

	So	Sc	Ac	CII .10
Stay-ins N = 110				
1	38.19	22.45	13.56	-0.57
2		53.37	27.87	-2.14
3			27.49	0.07
4				14.84
Dropouts N = 110				
1	47.16	23.80	19.00	-7.65
2		54.99	21.97	-10.96
3			27.44	-6.07
4				22.86

TABLE 17

VARIANCE-COVARIANCE MATRIX
FOR THREE SCALES OF CPI AND .05 SCALE OF CII

	So	Sc	Ac	CII .05
Stay-ins N = 110				
1	38.19	22.45	13.56	-1.00
2		53.37	27.87	-1.41
3			27.49	1.29
4				11.27
Dropouts N = 110				
1	47.16	23.80	19.00	-6.00
2		54.99	21.97	-8.70
3			27.44	-3.48
4				16.18

TABLE 18

CORRELATION MATRIX
FOR THREE SCALES OF CPI AND .10 SCALE OF CII

	So	Sc	Ac	CII .10
Stay-ins N = 110				
1	1.00	0.50	0.42	-0.02
2		1.00	0.73	-0.08
3			1.00	0.00
4				1.00
Dropouts N = 110				
1	1.00	0.47	0.53	-0.23
2		1.00	0.57	-0.31
3			1.00	-0.24
4				1.00

TABLE 19

CORRELATION MATRIX
FOR THREE SCALES OF CPI AND .05 SCALE OF CII

	So	Sc	Ac	CII .05
		Stay-ins N = 110		
1	1.00	0.50	0.42	-0.05
2		1.00	0.73	-0.06
3			1.00	-0.07
4				1.00
		Dropouts N = 110		
1	1.00	0.47	0.53	-0.22
2		1.00	0.57	-0.29
3			1.00	-0.17
4				1.00

$r < .195$, $p > .05$

In univariate analysis of variance there are certain underlying assumptions which should be met which are also applicable to multivariate analysis. These assumptions are:

1. The individuals in the various samples should be selected from normally distributed populations on the basis of random sampling.

2. The variance of the subgroups should be homogeneous.

3. The trait being studied should be normally distributed in each of the sample subgroups and its corresponding population.

In multivariate analysis the dispersion of a sample group is the matrix of variances and covariances for the group and for this study is shown in Tables 16 and 17.

The null hypothesis of the test of homogeneity of dispersions, which is called H_1 in the computer program developed by Cooley and Lohnes, (1962) asserts that the group populations have equal dispersions.

Another test considered in the above mentioned program is known as H_2 and is a test of the equality of group centroids. This test is the multivariate generalization of a one-way univariate analysis of variance.

TABLE 20

MEANS AND STANDARD DEVIATIONS
FOR THREE SCALES OF CPI AND .10 SCALE OF CII

Scale	Mean	S.D.	Mean	S.D.
	Dropouts	N = 110	Stay-ins	N = 110
So	34.89	6.87	37.40	6.18
Sc	24.95	7.42	26.25	7.31
Ac	24.26	5.24	25.75	5.24
CII .10	28.23	4.78	26.49	3.85

For H_1, $M = 19.72$; $F^{10}_{227206} = 1.93$ $p < .05$

For H_2, Lambda $= 0.931$; $F^{4}_{215} = 3.99$ $p < .01$

TABLE 21

MEANS AND STANDARD DEVIATIONS
FOR THREE SCALES OF CPI AND .05 SCALE OF CII

Scale	Mean	S.D.	Mean	S.D.
	Dropouts	N = 110	Stay-ins	N = 110
So	34.89	6.87	37.40	6.18
Sc	24.95	7.42	26.25	7.31
Ac	24.26	5.24	25.75	5.24
CII .05	22.53	4.02	20.89	3.56

For H1, $M = 17.96$; $F\,\overset{10}{227206} - 1.76$, $p >.05$

For H_2, $\text{Lambda} = 0.920$; $F\,\overset{4}{215} = 4.58$, $p <.01$

It will be noted that the test of H_1 provides an F-ratio, for the .10 CII scale, of 1.93, and for the .05 CII scale an F-ratio of 1.76. Checking the F-table it is noted that the value of F needed for significance at the 5 per cent point is 1.83. Thus the null hypothesis testing the homogeneity of dispersions is rejected for the .10 CII scale and fails of rejection for the .05 CII scale.

In testing whether there is a significant difference between the group centroids for dropouts and stay-ins, in the test known as H_2, the null hypothesis of no difference is rejected for both the .10 CII scale and the .05 CII scale at the .01 point. This illustrates the fact that small departures from homogeneity of dispersions are relatively unimportant in determining the significance of difference between means.

Since one of the aims of discriminant analysis is to enable us to determine into which of two groups a student will be classified, it will be helpful if the centroids and dispersions of the groups in the discriminant space are computed. We can examine the group differences by noting the group means and standard deviations shown in Tables 20 and 21.

TABLE 22

DISCRIMINANT ANALYSIS: ROOT AND VECTORS OF $W^{-1}A$
FOR THREE SCALES OF CPI AND .10 AND .05 SCALES OF CII

Scales	Normalized Vectors .10	.05	Scaled Vectors .10	.05
So	0.47	-0.35	0.90	-0.73
Sc	-0.23	0.21	-0.50	0.49
Ac	0.35	-0.35	0.54	-0.59
CII	-0.78	0.84	-1.00	1.00

The scaled vectors indicate that the large contributors to group separation in discriminant function are the So and CII scales. Tables 20 and 21 show that dropout groups have higher means on scales for the CII and lower means for the So scale of the CPI.

The appropriate weights for maximizing the spread between composite scores for dropouts and stay-ins are as follows:

.10 Level Scale

$$X' = .0890\,So - .0436\,Sc + .0667\,Ac - .1493\,CII$$

.05 Level Scale

$$X' = -.0778\,So + .0467\,Sc - .0781\,Ac + .1886\,CII$$

It will be noted that the highest weights have been assigned to the So scale of the CPI and the developed scales of the CII. A summarization of the four F tests for the significance of group differences on each of the four scales is shown in Tables 23 and 24.

TABLE 23

UNIVARIATE F TESTS
FOR THREE SCALES OF CPI AND .10 SCALE OF CII

		.10 Scale		
Scale	Among Mean Squares	Within Mean Squares	F - Ratio $n_1 = 1$; $n_2 = 218$	p
So	348.77	42.68	8.17	<.01
Sc	94.25	54.18	1.74	--
Ac	120.77	27.47	4.40	<.05
CII .10	165.82	18.85	8.80	<.01
ndf	1	218		

TABLE 24

UNIVARIATE F TESTS
FOR THREE SCALES OF CPI AND .05 SCALE OF CII

		.05 Scale		
Scale	Among Mean Squares	Within Mean Squares	$n_1 = 1$; $n_2 = 218$	p
So	348.77	42.68	8.17	<.01
Sc	94.25	54.18	1.74	--
Ac	120.77	27.47	4.40	<.05
CII .05	147.27	13.73	10.73	<.01
ndf =	1	218		

The total sample used in this analysis was 220 students, equally divided between dropouts and stay-ins. Discriminant analysis tests the significance of the group separations, provides an efficient basis for examining the nature of differences found, and provides equations for predicting into which of two groups the individual student will fall.

By referring to Tables 20 and 21 the differences which exist between the means for dropouts and the means for stay-ins on the different variables are evident. That there are significant differences can be seen in Tables 23 and 24 which examine the interrelationships among and within the groups.

The scaled vectors, shown in Table 22 indicate that the large contributors to group separation in discriminant function are the So and CII scales which are negatively correlated. The high weighting for the So scale of the California Psychological Inventory indicates that the values measured by that scale are relevant in determining whether or not a student will remain in college or drop out. It appears to be important whether or not the student is persistent, deceitful, critical, defensive, and takes an active part in social activities. This generally duplicates the findings of Brown (1961) and Astin (1964) which were cited earlier in this study.

Group centroids in one dimensional discriminant space are shown in Table 25.

TABLE 25

GROUP CENTROIDS FOR .10 AND .05 SCALES OF CII
IN ONE DIMENSIONAL DISCRIMINANT SPACE

	.10 Scale	.05 Scale
Dropouts N = 110	-3.038	3.606
Stay-ins N = 110	-0.292	1.103

In the last phase of discriminant analysis the profile of an individual is compared with agroup in order to determine whether or not he belongs in that group. In expressing this, it can be said that the region of the test space for Group 1, Dropouts, is defined as the space for which the Group 1 chi-square is smaller that the Group 2, Stay-ins, chi-square. The region for Group 2, Stay-ins, is defined as the space for which Group 2 chi-square is smaller than the Group 1 chi-square. Thus an individual is assigned to that group for which his probability of group membership is highest. In Table 26 the results of classification for the dropout groups and stay-in groups upon which this study is based are shown.

TABLE 26

CHI SQUARE IN A 2 x 2 TABLE

	.05 Scale				.10 Scale		
	DO	SI			SO	SI	
Grp. 1 (Dropouts)	59	51	110	Grp. 1	53	57	110
Grp. 2 (Stay-ins)	22	88	110	Grp. 2	20	90	110
	81	139	220		73	147	220
	chi square = 40.18				chi square = 59.28		
ndf = 1	p < .001			ndf = 1	p < .001		

The above contingency table assumes that chance alone is operating. To set up the expected frequencies, since the groups are equal in size, i.e., N = 110 Dropouts, N = 110 Stay-ins, assign half of each group to the Dropout or Stay-in category. For a 2 x 2 table there is only 1 degree of freedom. Chi square for ndf = 1 is 3.84 $p \overset{=}{<} .05$, 6.63 $p \overset{=}{<} .01$, and 10.83 $p \overset{=}{<} .001$.

In summary therefore, classification procedures of discriminant analysis gave the following information:

a. There were fewer dropouts identified by discriminant analysis than by the developed dropout scales alone.

b. Of the total number of dropouts, N = 110, discriminant analysis in conjunction with the .05 scale could identify only 59 as dropouts for a "hit" rate of 53.6 per cent. In conjunction with the .10 scale, discriminant analysis could identify only 53 of 110 for a "hit" rate of 48.2 per cent.

c. Of the total sample, N = 220, consisting of both dropouts and stay-ins, discriminant analysis in conjunction with the .05 scale classified 139 students as stay-ins and 81 as dropouts, while the .10 scale classified 147 as stay-ins and 73 as dropouts.

d. Of the 110 actual stay-ins using the .05 scale, discriminant analysis classified 22 as dropouts, while the .10 scale classified 20 as dropouts.

The variables So, and Sc account for 76 to 78 per cent of the total variance among the scales used in this study. The means and standard deviations of the variables are shown in Tables 11 and 13, while the intercorrelations are shown in Tables 18 and 19. These scales along with the developed scales of the College Interest Inventory appear to measure socialization, self control and the ability to conform to customs, rules and mores. The negative relationships between the scales of the California Psychological Inventory and the College Interest Inventory are a function of scale direction. In other words, as the scores of the College Interest Inventory go up, the scores on the scales of the California Psychological Inventory go down. This however only applies to dropouts and is not applicable to stay-in as will be noted in Tables 18 and 19. It will be seen in the scatterplots shown in Appendix F that these data possess both homoscedasticity and linear regression. That is, the standard deviations of the arrays (rows and columns) tend to be equal, and the means of the rows and columns fall along a straight line.

Since the three scales of the California Psychological Inventory have an intercorrelation of about .50 with each other and their correlation with the scales of the College Interest Inventory is significant at least at the .05 level of significance, except for the Ac and .05 scales which are significant at the .10 level, it would appear that a general characterization of the dropout student could be couched in the descriptive terms of the scales taken from the manual of the California Psychological Inventory. (Gough, 1957) A generalized description of the dropout then would be somewhat as follows:

> "A resentful, rebellious individual given to excess, ostentatious in his behavior, dominated by impulse, while being self-centered and uninhibited and overemphasizing personal pleasure and self gain. An individual easily disorganized under stress or pressures

to conform, and pessimistic about his occupational future."

While the above description does not purport to be a classic description of the dropout, it will be noted that it does contain certain elements which are all too frequently apparent to those engaged in counseling students at any level.

Academic and Vocational Choice

As corollary information which it was possible to derive from the College Interest Inventory Answer Sheet, the student was asked to provide information relative to his choice of major academic field in college, and, to the greatest degree possible, the occupational choice which he had decided upon at the time of entering his freshman year in college. This information was requested despite the known fact that occupational choice frequently changes during the time the student is in attendance at college. From the information obtained, there is little appreciable difference between dropouts and stay-ins either in their choice of major academic field or in their announced occupational choice. A breakdown by percent of these data is contained in Tables 27 and 28, respectively.

TABLE 27

A COMPARISON OF CHOICE OF MAJOR ACADEMIC FIELDS
BETWEEN DROPOUTS AND STAY-INS

Major Field		Dropout Percent		Stay-in Percent
Natural Science		16.3		16.3
Business				1.8
Foreign Language		2.7		2.7
Mathematics		14.4		13.5
Education		1.8		
Humanities		9.9		9.9
Social Science		31.5		30.6
Foreign Affairs		.9		.9
Philosophy		3.6		5.4
Undecided		18.9		18.9
	N = 110	100.0	N = 110	100.0

It can be seen readily that there is no significant difference between the major academic field choices of dropouts and stay-ins. It is also apparent that many students start their college careers without any particular choice of a major field and little idea of what they intend to do with their college education. This, of course, is generally in accord with the aims of the liberal arts college program, to provide an opportunity to think, write and speak cogently from a broad base, anchored in the physical and behavioral sciences, literature and the humanities, and with a sensitivity to the expressive arts.

TABLE 28

A COMPARISON OF ANNOUNCED OCCUPATIONAL CHOICE BETWEEN DROPOUTS AND STAY-INS

Occupational Choice		Dropout Percent		Stay-in Percent
Medicine		2.7		3.6
Teaching		13.5		9.0
Religion				.9
Research		2.7		3.6
Government Employment		1.8		.9
Law		3.6		9.9
Economics				.9
Engineering		.9		
Military Career				.9
Social Work		.9		
Forestry				.9
Business				.9
Undecided		73.9		68.5
	N = 110	100.0	N = 110	100.0

Here further substantiation of the tenet that the liberal arts curriculum encourages the possibility of delay in commitment to a specific major field of concentration and in turn a delay in occupational choice is evidenced. Ginzberg, Ginsburg, et al, as cited in Hoppock (1963) feel that occupational reality begins to take place at the age of about seventeen, yet here there is evidence that a substantial majority - 71.2 per cent - of the total sample used in this study is undecided about their vocational choice when they enter college. The median age of the sample is 18.05 years.

The consensus of the various authors cited in Hoppock (1963) is that vocational choice is a developmental procedure and is attained or arrived at with vocational maturity. The evidence presented here is not at variance with those statements.

CHAPTER V

SUMMARY AND CONCLUSIONS

Summary

The central problem of this study was to develop and validate a dropout scale for the *College Interest Inventory* which might be used to differentiate between dropouts and stay-ins at liberal arts colleges. It was determined that the scale would be developed on male students only, who were enrolled in a liberal arts curriculum. At present there is no instrument which effectively predicts dropouts at the college level. Although there have been numerous studies of college dropouts which have attempted to evaluate such things as their reading ability, intellectual ability, personality characteristics, environmental stress, study habits and grades, among other things, no single measure has been completely satisfactory in predicting dropouts, although the So, Sc, and Ac scales of the *California Psychological Inventory* have been used to predict dropouts at the five per cent level of confidence.

From the review of the literature it was concluded that the causes for dropping out of school are many and vary according to the person and the school. The complex of causes which produce this situation seemingly consists of those which are primary (found in most dropouts) and those which are secondary in importance (found peculiar to a given dropout). One of the aims of any study of dropouts is to identify as many causes as possible. However, it must also be realized that in many cases it is the sheer multiplicity of causes, and their cumulative weight bearing down upon the student, which force him to withdraw from school. It was hoped that this study would contribute toward development of a predictive device to aid in the identification of potential college dropouts and permit establishment of a counseling program to make the most efficient placement for them.

The basic sample for this study was composed of students enrolled in a liberal arts curriculum at nine New England colleges and universities, whose enrollment ranged from less than 500 students to more than 10,000 students. There were 1,260 college freshmen who took the *College Interest Inventory* and the *California Psychological Inventory* during the fall semester of the school year 1965-1966. The samples used to develop and validate scales at the .10 level and .05 level were 45 students who dropped out during the first semester, and 65 dtudents who dropped out during the second semester. Utilizing a table of random numbers a number of stay-ins were selected equal to the dropouts from each school and used for item identification purposes.

The scoring scales were developed by determining items which showed a significant difference between proportions of dropout and stay-in responses using a table of phi coefficients. The new scales, called the .10 level scale and the .05 level scale, were composed of items at the .10, .05, and .01 level of significance, and the .05 and .01 level of significance, respectively. These items were keyed in the direction of dropout responses and used to score answer sheets of the group on whom the key had not been constructed.

The mean scores for the 45 member groups of dropouts and stay-ins and for the 65 member groups were each tested for significant differences. Significant differences between the means of stay-ins and dropouts were found at the .05 level when scoring the 45 member groups using either the .10 level scale or the .05 level scale constructed from responses of these groups. This is a function of construction. When these scales were scored against the 65 member groups, the difference between the means of dropouts and stay-ins, utilizing the .10 level scale was not significant at the five per cent level of probability. However, the difference between the means of dropouts and stay-ins for these groups was significant at the five per cent level when the second scale, the .05 level scale was used.

Attempts to provide further cross validation by constructing scales on the 65 member groups and then scoring these scales against the 45 member groups were made. Again, items which showed a significant difference in proportion of dropout and stay-in responses using a table of phi coefficients were used. Although these scales differentiated in their original groups, this really acts as a check on construction. When these scales were scored against the 45 member groups the difference between the means for dropouts and stay-ins was not significant.

Although the .05 level scale was more effective in discriminating between dropouts and stay-ins than the .10 level scale when the small groups of 45 and 65 members were used, there was a considerable amount of overlap in scores for dropouts and stay-ins.

When a frequency distribution was made of the total group of dropouts, N = 110, and stay-ins, N = 110, in order to determine the extent to which the scale scores of the two groups overlapped and the means for each group computed and tested for significance of the difference between the means, it was found that the difference between the means for the total groups of dropouts and stay-ins was significant at the .01 level of probability regardless of whether the .10 level scale or the .05 level scale was used.

Discriminant analyses, using the scores from the California Psychological Inventory scales for So, Sc, and Ac scales and the .10 level scale or the .05 level scale, were performed. These analyses were to maximize whatever difference existed between the dropout and stay-in groups, to determine whether or not discriminant analysis was of assistance in maximizing classification of dropouts and stay-ins. These analyses were of little assistance in classifying dropouts and stay-ins. Of the 110 actual dropouts, discriminant analysis was able to predict only 33.6 per cent as dropouts using the .05 level scale, and only 48.2 per cent using the .10 level scale. At the same time, discriminant analysis predicted as dropouts 20 per cent of those who wre stay-ins using the .05 level scale and 18.2 per cent using the .10 levl scale. This then indicates that although there is a significant negtive correlation between the scales developed by the writer and the thre scales of the California Psychological Inventory, that they contribut limited value towards discriminant analysis in the matter of classifyng dropouts and stay-ins.

Disposition of Hypotheses

The hypotheses which were proposed for this study were to examine the relationships between the So, Sc, and Ac scales of the California Psychological Inventory and the proposed scale or scales of the College Interest Inventory, with a null hypothesis of no relationship between the scales of the two instruments.

1. The hypothesis of no relationship between the So scale of the California Psychological Inventory and the developed .10 level scale and/or the .05 level scale is rejected. The relationship between the indicated scales is significant at the .05 level of probability.

2. The hypothesis of no relationship between the Sc scale of the California Psychological Inventory and the .10 level dropout scale and/or the .05 level dropout scale is rejected. The relationship between the indicated scales is significant at the .01 level of probability.

3. The hypothesis of no relationship between the Ac scale of the California Psychological Inventory and the .10 level dropout scale is rejected. The relationship between the indicated scales is significant at the .05 level of probability.

4. The hypothesis of no relationship between the Ac scale of the California Psychological Inventory and the .05 level dropout scale fails of rejection. The relationship between the indicated scales is not significant at the .05 level of probability.

5. The .05 level dropout scale of the College Interest Inventory does successfully discriminate between those students enrolled in a liberal arts curriculum who remain in college and those who drop out of college. The hypothesis is rejected at the .05 level of significance.

Conclusions

This study was designed to develop a scale which could be used with the College Interest Inventory developed by Cottle, to predict male dropouts at liberal arts colleges. It was hoped that this scale or scales would have sufficient discriminatory power to predict the potential early school leaver so that preventative measures could be taken which would increase the probability of the student remaining in school.

If information of this type could be secured, it could be of particular value to school administrators and to counselors and faculty members. It would provide advance warning of dropout and allow administrative mobilization of forces to undertake whatever remedial action was necessary and possible to increase the chances of the student remaining in school or securing an appropriate alternative placement if he decides to leave.

The scales developed by the writer do indicate sufficient stability to warrant additional research with other groups. The scales also appear to be related in limited fashion to the interpersonal relationships measured by the So, Sc and Ac scales of the California Psychological Inventory.

and as such can serve to reinforce the impact of these scales if and when both instruments would be used on an entering freshman class.

When administered to male freshmen students at ning New England colleges and universities, with total enrollments in each school ranging from less than 500 students to more than 10,000 students, enough questions were answered differently by the actual dropouts as a group to show that there is a difference in response pattern between dropouts and stay-ins, even though there does appear to be considerable overlap in item response. There is evidence that the difference in response is due to the discriminatory quality of the developed scale and not to chance.

The scales produced a considerable number of dropout scores, at a ratio of 4 or 5 to 1, above the highest scores of the stay-ins. This indicates the possibility of establishing a "cut-off" score which might delineate the potential dropout from students in general.

While the number of items found significant and incorporated into the dropout scale was not exceedingly high, representing only 30 per cent of the questions for the .10 level scale and 23 per cent for the .05 level scale, still these items were sufficiently discriminatory so that a comparison of the scores of the dropouts with scores of the stay-ins showed the dropout group to have the higher scores on the developed scales. In a similar vein, the dropouts had lower scores on the three scales of the California Psychological Inventory so that significant negative correlations were found between the scales of the two instruments.

In view of the fact that only the .05 level dropout scale is significant at the .05 level of confidence when scored against both groups, the .10 level dropout scale can be ignored. The .05 level dropout scale correlates well with the So and Sc scales of the California Psychological Inventory with relationships significant at the .05 level or beyond.

Examination of the content of the significant items indicates that the dropout is concerned with his past academic performance, the educational level of his family, the socio-economic level of his home, a need for earning money, and a need for freedom to express himself.

From the results of this study it would appear that the instrument and the developed scales are of limited use in predicting dropouts in this population. To strengthen the value of the developed scales it may be necessary to re-define the dropout criterion, so as to eliminate those individuals who were forced to leave school because of academic deficiencies and were thus more correctly labeled "force-outs" than dropouts.

The fact that there was little improvement over chance in the discriminant ability when the three scales of the California Psychological Inventory were used does not detract from the potential value of the developed scales. It is also possible that a reworking of some of the questions which were significant only at the .20 level would improve the discriminatory ability of the scales.

Recommendations for Further Research

There are many other areas for study which might provide further information concerning validity and usefulness of the developed scales. The sample upon which the scales were developed was a regional one, but one which attempted to embrace a variety of types of educational institutions.

The use of mean scores of the variables indicate that these means are representative of most of the members of the groups. However, it is possible that there are clusters of more homogeneous individuals within each of the groups studied, as was evidenced by the clustering about the mid-point of the range of scores for each group scored on both the .05 level dropout scale and the .10 level dropout scale.

Studies of a similar nature should be undertaken which would more stringently limit the scope of the term "dropout" than was done in this study. If the developed scales are to be of value, each should discriminate more strongly than it does now between dropouts and stay-ins. While the 45 member group and the 65 member group of dropouts were similar in virtually every respect, the fact remains that the 45 member group had few academic dropouts while the 65 member group contained a number of academic dropouts or "forceouts".

There should be studies made using this instrument and the developed dropout scales on girls enrolled in liberal arts curriculum, as well as studies on both males and females enrolled in specialized fields.

Another area which might be studied is the correlation between the College Interest Inventory, the California Personality Inventory, and the Edwards Personal Preference Schedule in terms of the psychological needs measured by the EPPS. This study then might add more data to the negative correlations obtained between the College Interest Inventory and the California Psychological Inventory in terms of the psychological needs measured by the Edwards Personal Preference Schedule and the California Personality Inventory.

A longitudinal study should be made during which freshmen are administered the inventory and then followed through the four years of their college career, or until its termination because of dropout.

While the results of this study have not been as definitive as one might wish, it still provides an opportunity for counselors to become aware of the possibilities inherent in this research instrument. It is recognized that this study is dealing only with a research edition and that this inventory is still in an experimental stage and not ready for widespread use at the present time. Also, prior to this time, there has been no attempt to develop or validate any scale for this instrument. The results attained offer definite encouragement and certainly merit further research upon different populations.

If this study has stimulated further thinking and research in the areas indicated by the writer, then time and effort on this project have been well spent.

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APPENDIX A

APPENDIX A

RESEARCH EDITION

THE COLLEGE INTEREST INVENTORY
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DIRECTIONS TO STUDENTS:

The questions are intended to find out how you feel about college and show a counselor how he can help you accomplish more in college. THERE ARE NO CORRECT ANSWERS. Your answers are scored by a machine which reports part and total scores. Your answers to each item will be inspected by your counselor only at your request. Although there is no time limit, work as rapidly as possible. Use the true-false spaces on the answer sheet for your response to each item.
Any soft-lead pencil maybe used.
Fill in the blanks indicated on the answer sheet with your name, the date, your date of birth, your sex, your college, your year of graduation, your home address, your school within the college or university, your proposed major and your intended occupation after college.

QUESTIONS SIGNIFICANT AT

* .10 Level
* .05 Level
* .01 Level

*1. To get a job like my father's, I will have to be a college graduate.

*2. I am not doing well in school, but I do better outside school than most of my classmates.

*3. My college teachers do not seem to understand me.

4. It would be more fun to do research than organize a sales campaign or a political campaign.

5. I do not feel well most of the time.

*6. My father changes jobs frequently.

7. In order to succeed in a job today, you must have a college education.

8. I would rather work with ideas or write than work in a laboratory or shop.

9. Our family gets together often as a group to do something for fun.

10. College work is fun.

*11. I have a car at college.

*12. I would like a job where I would be working with people rather than machines.

13. No one in our family spends much time reading.

14. My mother completed high school.

15. I would be happier in college if I could buy better clothes.

16. I would rather be in a science club than in school plays.

17. I have many friends attending this school.

18. I would rather give orders than take orders from others.

19. My parents are active in community affairs.

20. I would rather work in an office than do outdoor work.

21. I would like to get married at once.

22. I never have to work hard to get passing marks.

23. I would do anything rather than stay at home.

*24. I would like to be in church work rather than be in a business position.

25. My mother does a lot of church work.

26. I have never failed anything in school.

27. I have planned my college courses and major carefully.

28. I would rather write poems than be a chemist.

29. I usually feel at ease with others.

*30. If my parents would let me, I would not attend college.

31. I seldom feel lonely.

32. It is more fun to work with your hands than to study.

33. It takes me longer to learn something than it does most people.

*34. The students in my class like me.

*35. I participate in at least one college activity.

36. I would rather work alone in research than be a salesman.

37. I do not like to drink alcoholic beverages.

38. I am confident of my ability to succeed in college.

39. I do better in school than my brothers and sisters do.

40. It is more fun to take part in sports than to study history.

41. I have more friends of my own sex than of the opposite sex.

42. There is at least one bedroom for every two people in our family.

43. Even though I do as well as I can, my grades are always below average.

44. It would be more satisfying to invent a machine or process than to sell it to people.

*45. I do not like the subjects I have to take in college.

46. I would rather have a job than go to school.

47. I am as capable and smart as other students.

48. I would rather prepare drug prescriptions than be a clergyman or a teacher.

49. I wish there was someone with whom I could discuss the things that bother me.

50. I feel my father favors other members of my family over me.

51. Most of my family will be college graduates.

52. I like people who are neat and clean.

*53. I have always worked hard to get good grades.

54. I wish my circle of friends was larger.

*55. I do not like to do the things other people expect of me.

56. I would rather write stories than repair machines.

*57. My father usually takes his lunch to work with him.

58. If I were paid to go to school, I would cut classes less often.

59. Often when I awake I am as tired as when I went to sleep.

60. I would rather teach people than operate a machine or run a computer.

*61. I feel I know a lot about the kind of work I want to do for the rest of my life.

62. My father wants me to complete college.

63. I get a least average marks in college.

64. It would be more fun to be in politics than to make things in a shop or laboratory.

65. I do not think that I have a quick temper.

66. The values that govern my life are clear and distinct.

67. Most of the other students have better clothes than I do.

68. I would rather take engineering, home economics or nursing than art, music or English.

69. If I take a job like my father's, I will not need a college degree.

70. I do not mind getting to a party after all the others are there.

71. Other students seem to be happier than I am.

*72. I would rather hunt and fish than go to parties.

73. The teachers in our school are too busy to talk with students.

74. I can concentrate as well as the other students in my classes.

75. My father did not complete high school.

76. Emotional scenes in a movie or on television make me cry.

77. I can talk to older people more easily than to people my own age.

78. I seem to have pimples and blotches on my face very often.

79. I have never had the opportunities to succeed that others have had.

80. I would rather do math than English.

*81. I am not "going steady."

82. I know many of the students in my classes.

*83. I am not doing very well in college.

84. I do not like work which gets my hands greasy or dirty.

85. I have never been called to the dean's office.

86. I frequently bring college friends home for visits.

87. It is important to me to say what I think.

88. Men have more influence on the things I do than women.

89. Everyone in our family goes his own way.

90. College would not be worthwhile, if I could not join clubs or fraternities.

91. I would rather quit than fail in college.

*92. It would be more interesting to be a worker in the sciences than in business.

93. I study more than 30 hours per week.

*94. If my parents had not urged me to come here, I would have liked to attend another school.

95. I find it difficult to organize my work and get assignments done on time.

96. The things my father does at work or in his spare time are more fun than those my mother does.

97. I have to complete college in order to do what I want to do to earn a living.

98. My mother encourages me to do well in school.

99. My father has to wear a suit to work.

100. It would be more fun to learn to operate a new machine than to give a party.

101. I am not an efficient reader.

102. My mother likes serial stories on radio or television.

103. I am not sure what I want to choose for a major or a career.

104. It would be more fun to attend an art exhibit than an auto show.

105. I do not like college.

*106. We rent our home.

107. I feel the answers I write on examinations are more correct than the instructor does.

108. I would rather take engineering drawing or home economics than art, music or drama.

109. I feel that most people understand me.

*110. The rules made for most people do not make sense for me.

111. I have never set up a regular schedule to study.

112. I would rather be a popular singer than president of a business organization.

113. An important reason for going to college is to find a suitable person to marry.

114. I have never had to repeat a grade in school.

115. I cut a class at least once a week.

116. I would rather raise flowers or vegetables than animals like dogs or horses.

*117. It is easy to keep my mind on any task I am trying to do.

*118. Making a high income is more worthwhile to me than spending my life on a low income helping the poor.

119. My family would rather watch television than read books or play bridge.

120. I would rather go on a camping trip than go to a musical concert.

121. I have owned a motorcycle.

*122. I only came to college because most of my friends were going to college.

123. I do not have enough money for adequate living in college.

124. It would be more interesting to be a social worker than a tool and die maker.

*125. Most of my fellow students are not interested in the kinds of activities I like.

*126. I dislike to talk in a group or in a class.

●127. I do not like the place where I live in college.

*128. I would rather watch sporting events on television than a serious play.

*129. I spend a good share of my time in the library.

130. I think I am quite competent in most of the things I do.

*131. I find it easy to speak in a group where I am the center of attention.

32. I would rather know modern languages than mathematics.

133. I like to follow orders and do what people tell me to do.

134. Guests frequently come to our house for meals or to stay for the night.

135. I like to be in positions of leadership.

136. I would rather be an engineer than a social scientist.

137. My father is in business for himself.

138. I would like to be a teacher.

139. Most of my friends do not go to college.

140. It would be more interesting to be an interior decorator than a building contractor.

141. I would rather solve my own problems than talk to a counselor about them.

142. Many of my school courses are a waste of time.

143. I would rather get married than finish college.

144. It would not bother me to cut up animals or insects.

145. I would rather do things by myself than in a group.

146. Outside work interferes with my class preparation or attention.

147. I often daydream in my classes.

148. It would be more interesting to be a librarian than an army officer.

149. I tend to clutch on examinations and not do as well as I could.

150. There are somethings I think about that I would never discuss with anyone.

151. I have to complete college to earn a living.

152. I like to take part in sports.

153. I would not mind enlisting in the armed forces.

154. I do most of my studying right before examinations.

155. I am interested in all of my school courses.

156. I would rather play tennis than baseball or football.

157. I never have trouble with my complexion.

158. No one else in my family is interested in college work.

159. My high school graduating class was less than 25.

160. I would rather sell something than work in a laboratory.

161. I wish I were not sick so often.

162. I need to be in the mood before I can study effectively.

163. I have never failed any subject in college.

164. I would rather be a lawyer than an engineer.

165. I want to go to work full time so I can have my own money.

166. I would like to go somewhere else to college.

167. I get my class assignments done on time.

168. I do not like classical music.

169. I am more comfortable with a few people I know well than with a large group of people.

*170. I was sent out of class frequently in high school because of disagreement with the teacher.

171. I feel my high school preparation was adequate for what I am doing.

*172. I would rather swim, ski or fish than read.

*173. I have never learned how to use the libraby effectively.

*174. I would never want to be expelled from school.

*175. Counting my parents and me, there are more than seven in our family.

*176. I would rather do religious work than be in business.

*177. My parents want me to complete college.

178. I would rather do things by myself than participate in groups.

179. I am not a boarding student at college.

180. I would rather read a book than participate in an athletic activity.

*181. My teachers give others better marks for work that is no better than mine.

*182. This school was my first choice when I was in high school.

*183. I am an effective leader in groups.

*184. College is too theoretical and not very practical.

*185. My English skills are very good.

186. I study my hardest homework first.

*187. My parents usually go to church at least once a week.

*188. I like classes where we study theory better than those where we practice an activity.

*189. I would like to change my present major.

*190. I am a good public speaker.

*191. My father likes to read books.

*192. I would rather write a book or song or paint a picture than invent a machine, a scientific process or a new procedure.

*193. My teachers resent it when I argue with them.

*194. There are several people with whom I discuss my personal life.

*195. I would rather be here in college than in military service.

196. I would rather read blueprints, graphs or charts than read a history book or an English text.

197. Most of my friends are older than I.

*198. Our family subscribes to at least five magazines.

*199. Sometimes I want to say things just to hurt people.

*200. I would rather work in business than in a job helping others.

201. I participated in several activities in high school.

*202. When I miss classes I make up my assignments.

*203. I will have to help support younger members of my family while they go to college.

204. I like love scenes on television.

*205. It is hard to take useful notes in classes.

206. I usually get good grades on my work in English.

*207. I am not going to get married until I finish college.

208. I would rather do things with my father than with my mother.

*209. I usually do what I am expected to do.

210. I am older than most of the others in my class.

211. My parents still consider me to be a child.

212. I think I am awkward when I take part in sports.

213. I often force myself to eat even though I am not hungry.

214. I do not like to take orders from others.

215. My high school graduating class was more than one hundred.

216. Making money is much more important than a job helping people better themselves.

*217. I am usually happy.

218. I feel tired most of the time.

219. I do not think I really know how to use reference files in the library.

220. I wish I had more friends than I do.

*221. Life gives others a better chance than I get.

222. I study less than 20 hours per week.

223. I like to follow a definite pattern in work and study.

224. I think people my own age are silly.

225. My father works with his hands.

226. I like to finish a task before I leave it.

227. My parents are very strict.

228. I like to cut classes.

*229. It is difficult to do anything well.

230. My life goals are clear to me.

231. I was absent from school more than twenty days last year.

232. My father works at a desk most of the time.

233. My future seems hopeless and confused.

234. I find it hard to concentrate on my school work.

235. My father supervises others in his work.

*236. I would rather be here in college than at home working in a job.

237. My parents do not belong to many organizations or clubs.

238. My background from high school in my major is adequate for the work I am required to do.

239. I like college.

240. I go to the movies several times a week.

*241. I find it hard to believe most people will win any way they can.

242. I would rather do familiar things than start new tasks.

243. I am seldom moody or blue.

244. Both of my parents are less than 55 years old.

245. My mother and father both work.

*246. I would like to change to another university or college where the environment would suit me better.

247. Our family moves about once a year.

*248. Most of the time I prefer activities I can do by myself.

249. I think it is all right to have alcoholic drinks in mixed groups.

250. I like most of the people with whom I live in college.

APPENDIX B

APPENDIX B

ADMINISTRATIVE INSTRUCTIONS

Purpose - It is hoped that this scale will identify potential dropouts in liberal arts colleges. It is in the experimental stage and it will be necessary that the College Interest Inventory, for which this scale is being developed, be given to a large number of students, and then to followup these students to locate dropouts among them. Answers given by students who remain in school, when compared with the answers of those who have dropped out of school, will show the usefulness of individual items in the scale for predicting dropouts.

Administration of the Inventory - It is requested that the students not be told anything to the effect that this is a test to determine whether or not they are likely to be dropouts.

Each student is provided with a copy of the College Interest Inventory and an electrographic pencil. The following should be read to them:

Your school is one of nine New England colleges which has been selected to take part in research on the College Interest Inventory and the California Psychological Inventory. You will take the College Interest Inventory first. Answer True or False to each question and place your answer on the separate answer sheet provided in the appropriate square. If you feel that you cannot answer a question, leave it blank. There are no right or wrong answers to these questions, but the answers express how you feel about yourself, your family, school, and social life. Please answer the questions as truthfully as you can as you will be helping in an experimental study which it is felt can be of assistance to college students. You should be able to complete this inventory in about thirty minutes.

Before starting to answer the questions please fill out the top of the answer sheet with your full name, age, sex, name of college or university, school within the college or university, your academic major, the year your class will graduate, and your probable occupational choice after leaving school. After you have completed this portion of the answer sheet you may commence the test.

The instructions for administering the California Psychological Inventory were given at the appropriate time, and followed.

APPENDIX C

APPENDIX C

TABLE OF PHI COEFFICIENTS AND SIGNIFICANCE - SAMPLE A

Item	No. True Responses		Proportions			Figures of Significance			
						.17	.20	.27	Value
No.	DO	SI	DO	SI	ø	.10	.05	.01	Level
1	28	20	.622	.444	.17	x			
2	17	7	.377	.155	.25		x		
3	3	0	.067	.000	.71			x	
4	19	21	.422	.466	.04				
5	2	2	.044	.044	.03				
6	45	2	.999	.044	.96			x	
7	27	20	.599	.444	.16				
8	24	25	.533	.555	.01				
9	20	24	.444	.533	.08				
10	13	18	.289	.400	.12				
11	16	7	.355	.155	.22		x		
12	36	42	.799	.932	.19	x			
13	8	10	.178	.222	.05				
14	37	35	.821	.777	.04				
15	6	5	.133	.111	.03				
16	19	20	.422	.444	.02				
17	21	23	.466	.511	.04				
18	30	34	.666	.755	.10				
19	14	16	.311	.355	.10				
20	17	23	.377	.511	.13				
21	4	2	.089	.044	.10				
22	11	14	.244	.311	.08				
23	16	10	.355	.222	.15				

APPENDIX C (Continued)

TABLE OF PHI COEFFICIENTS AND SIGNIFICANCE - SAMPLE A

Item	No. True Responses		Proportions			Figures of Significance			
						.17	.20	.27	Value
No.	DO	SI	DO	SI	Ø	.10	.05	.01	Level
24	11	4	.244	.089	.20		x		
25	7	13	.155	.289	.16				
26	20	18	.444	.400	.04				
27	20	23	.444	.511	.07				
28	18	19	.400	.422	.02				
29	33	36	.733	.799	.08				
30	6	00	.132	.000	.26		x		
31	29	25	.644	.555	.07				
32	28	26	.622	.577	.03				
33	10	11	.222	.244	.02				
34	31	38	.688	.844	.18	x			
35	20	32	.444	.710	.27			x	
36	27	22	.599	.488	.11				
37	17	18	.377	.400	.02				
38	34	33	.755	.733	.03				
39	19	15	.422	.333	.09				
40	31	33	.688	.733	.04				
41	32	32	.000	.000	.00				
42	41	42	.910	.932	.04				
43	6	2	.133	.044	.16				
44	31	28	.688	.622	.07				
45	9	2	.200	.044	.25		x		
46	6	3	.133	.067	.12				

APPENDIX C (Continued)

TABLE OF PHI COEFFICIENTS AND SIGNIFICANCE - SAMPLE A

Item	No. True Responses		Proportions			Figures of Significance			
						.17	.20	.27	Value
No.	Do	SI	Do	SI	Ø	.10	.05	.01	Level
47	40	36	.888	.799	.12				
48	18	12	.400	.266	.14				
49	25	19	.555	.422	.14				
50	6	2	.133	.044	.16				
51	22	27	.488	.599	.11				
52	41	43	.910	.955	.10				
53	13	21	.289	.466	.19	x			
54	27	26	.599	.576	.02				
55	13	3	.289	.067	.29			x	
56	30	27	.666	.599	.07				
57	32	14	.710	.311	.40			x	
58	12	13	.266	.289	.02				
59	23	18	.511	.400	.11				
60	28	32	.622	.710	.10				
61	17	9	.377	.200	.20		x		
62	43	43	.955	.955	.00				
63	24	24	.533	.533	.00				
64	25	28	.555	.622	.06				
65	30	31	.666	.688	.02				
66	26	22	.577	.488	.09				
67	8	3	.178	.067	.17	x			
68	21	13	.466	.288	.19	x			
69	24	18	.533	.400	.13				

APPENDIX C (Continued)

TABLE OF PHI COEFFICIENTS AND SIGNIFICANCE - SAMPLE A

Item	No. True Responses		Proportions			Figures of Significance			
						.17	.20	.27	Value
No.	DO	SI	DO	SI	Ø	.10	.05	.01	Level
70	35	38	.777	.844	.00				
71	10	5	.222	.111	.15				
72	16	8	.355	.178	.20		x		
73	5	3	.111	.067	.07				
74	31	30	.688	.666	.02				
75	10	12	.355	.266	.10				
76	7	6	.155	.133	.04				
77	13	11	.289	.244	.06				
78	12	15	.266	.333	.07				
79	4	1	.088	.022	.15				
80	17	22	.377	.488	.11				
81	23	39	.511	.866	.39			x	
82	24	23	.533	.511	.01				
83	12	4	.266	.089	.23		x		
84	17	15	.377	.333	.05				
85	32	34	.710	.755	.06				
86	9	15	.200	.333	.15				
87	35	38	.777	.844	.08				
88	28	31	.622	.688	.07				
89	19	18	.422	.400	.02				
90	5	4	.111	.089	.03				
91	18	13	.400	.287	.12				
92	27	13	.599	.289	.31			x	

APPENDIX C (Continued)

TABLE OF PHI COEFFICIENTS AND SIGNIFICANCE - SAMPLE A

Item	No. True Responses		Proportions			Figures of Significance			
						.17	.20	.27	Value
No.	DO	SI	DO	SI	Ø	.10	.05	.01	Level
93	7	8	.155	.178	.03				
94	8	3	.178	.067	.17	x			
95	13	9	.289	.200	.11				
96	20	19	.444	.422	.02				
97	37	39	.821	.866	.07				
98	41	42	.910	.932	.04				
99	27	26	.599	.577	.02				
100	16	12	.355	.266	.10				
101	18	17	.400	.377	.02				
102	13	13	.289	.289	.00				
103	21	24	.466	.533	.05				
104	8	7	.178	.155	.04				
105	7	1	.155	.122	.06				
106	8	0	.178	.000	.31			x	
107	8	10	.178	.222	.06				
108	20	26	.444	.577	.14				
109	28	29	.622	.644	.01				
110	8	2	.178	.044	.22		x		
111	25	20	.555	.444	.11				
112	16	12	.355	.266	.10				
113	3	2	.067	.044	.07				
114	30	36	.666	.799	.15				
115	3	2	.067	.044	.07				

APPENDIX C (Continued)

TABLE OF PHI COEFFICIENTS AND SIGNIFICANCE - SAMPLE A

Item	No. True Responses		Proportions			Figures of Significance			
						.17	.20	.27	Value
No.	DO	SI	DO	SI	ø	.10	.05	.01	Level
116	7	7	.155	.155	.00				
117	23	12	.511	.266	.25		x		
118	20	29	.444	.644	.20		x		
119	24	24	.533	.533	.00				
120	28	31	.622	.689	.07				
121	8	5	.178	.111	.10				
122	3	0	.067	.000	.19	x			
123	10	7	.222	.154	.08				
124	36	39	.799	.866	.09				
125	8	2	.178	.044	.22		x		
126	14	7	.311	.155	.18	x			
127	8	5	.178	.111	.10				
128	30	38	.666	.844	.19	x			
129	16	7	.355	.155	.23		x		
130	32	36	.710	.799	.12				
131	14	24	.311	.533	.22		x		
132	26	13	.577	.289	.29			x	
133	12	17	.266	.377	.12				
134	15	19	.333	.422	.09				
135	36	37	.799	.821	.00				
136	21	16	.466	.355	.11				
137	8	10	.178	.222	.05				
138	24	19	.533	.422	.11				

APPENDIX C (Continued)

TABLE OF PHI COEFFICIENTS AND SIGNIFICANCE - SAMPLE A

Item	No. True Responses		Proportions			Figures of Significance			
						.17	.20	.27	Value
No.	DO	SI	DO	SI	Ø	.10	.05	.01	Level
139	14	5	.311	.111	.25		x		
140	6	9	.133	.199	.09				
141	24	20	.533	.444	.09				
142	8	4	.178	.089	.13				
143	5	0	.111	.000	.24		x		
144	33	30	.733	.666	.07				
145	16	18	.355	.400	.04				
146	12	11	.266	.244	.02				
147	23	24	.511	.533	.02				
148	8	6	.178	.133	.07				
149	20	26	.444	.577	.14				
150	28	18	.622	.400	.22		x		
151	28	21	.622	.466	.15				
152	38	40	.844	.888	.07				
153	23	22	.511	.488	.02				
154	30	24	.666	.533	.14				
155	22	26	.488	.577	.09				
156	11	3	.244	.067	.24		x		
157	16	16	.355	.355	.00				
158	8	5	.178	.111	.10				
159	6	1	.133	.022	.21		x		
160	18	20	.400	.444	.04				
161	8	8	.178	.178	.00				

APPENDIX C (Continued)

TABLE OF PHI COEFFICIENTS AND SIGNIFICANCE - SAMPLE A

Item	No. True Responses		Proportions			Figures of Significance			
						.17	.20	.27	Value
No.	DO	SI	DO	SI	ø	.10	.05	.01	Level
162	35	33	.733	.777	.06				
163	26	32	.577	.710	.14				
164	30	34	.666	.755	.09				
165	18	14	.400	.311	.11				
166	10	6	.222	.089	.18	x			
167	36	39	.799	.866	.09				
168	16	18	.355	.400	.04				
169	38	34	.844	.755	.10				
170	7	2	.155	.044	.20		x		
171	29	34	.644	.755	.13				
172	16	32	.355	.710	.35			x	
173	42	20	.932	.444	.51			x	
174	4	44	.089	.377	.34			x	
175	11	4	.244	.089	.20		x		
176	42	7	.932	.155	.77			x	
177	19	44	.422	.977	.61			x	
178	15	12	.333	.266	.07				
179	14	13	.311	.289	.02				
180	7	5	.155	.111	.07				
181	18	7	.400	.155	.27			x	
182	20	12	.444	.266	.18	x			
183	6	25	.133	.555	.45			x	
184	19	4	.422	.089	.38			x	

APPENDIX C (Continued)

TABLE OF PHI COEFFICIENTS AND SIGNIFICANCE - SAMPLE A

Item	No. True Responses		Proportions			Figures of Significance			
						.17	.20	.27	Value
No.	DO	SI	DO	SI	ø	.10	.05	.01	Level
185	25	15	.555	.333	.23		x		
186	29	27	.644	.599	.02				
187	18	36	.400	.799	.41			x	
188	6	15	.133	.333	.24		x		
189	13	6	.289	.133	.18	x			
190	28	12	.622	.266	.35			x	
191	18	27	.400	.599	.20		x		
192	7	24	.165	.533	.39			x	
193	26	29	.577	.200	.39			x	
194	38	27	.844	.599	.27			x	
195	19	43	.422	.955	.58			x	
196	15	15	.333	.333	.00				
197	18	14	.400	.311	.09				
198	8	21	.178	.466	.31			x	
199	17	10	.377	.222	.18	x			
200	30	19	.666	.422	.25		x		
201	37	36	.821	.799	.03				
202	13	37	.289	.821	.53			x	
203	16	7	.355	.155	.23		x		
204	14	13	.311	.289	.02				
205	28	18	.622	.400	.22		x		
206	35	30	.777	.666	.12				
207	25	38	.555	.844	.31			x	

APPENDIX C (Continued)

TABLE OF PHI COEFFICIENTS AND SIGNIFICANCE - SAMPLE A

Item	No. True Responses		Proportions			Figures of Significance			
						.17	.20	.27	Value
No.	DO	SI	DO	SI	ø	.10	.05	.01	Level
208	25	27	.555	.599	.04				
209	34	4	.777	.088	.70			x	
210	14	17	.311	.377	.07				
211	13	7	.289	.155	.16				
212	15	11	.333	.244	.10				
213	4	3	.089	.067	.14				
214	23	25	.511	.555	.05				
215	33	33	.733	.733	.00				
216	9	14	.200	.311	.13				
217	39	45	.866	.999	.26		x		
218	10	10	.222	.222	.00				
219	16	18	.355	.400	.04				
220	24	22	.533	.488	.04				
221	5	1	.111	.022	.18	x			
222	15	15	.333	.333	.00				
223	26	26	.577	.577	.00				
224	9	6	.200	.133	.09				
225	18	18	.400	.400	.00				
226	37	38	.821	.844	.03				
227	12	10	.266	.222	.06				
228	5	3	.111	.067	.07				
229	14	7	.311	.155	.18	x			
230	22	15	.488	.333	.16				

APPENDIX C (Continued)

TABLE OF PHI COEFFICIENTS AND SIGNIFICANCE - SAMPLE A

Item	No. True Responses		Proportions			Figures of Significance			
						.17	.20	.27	Value
No.	DO	SI	DO	SI	Ø	.10	.05	.01	Level
231	5	4	.111	.089	.03				
232	20	19	.444	.422	.02				
233	7	5	.155	.111	.07				
234	14	15	.311	.333	.02				
235	25	20	.555	.444	.12				
236	35	42	.777	.932	.21		x		
237	30	33	.666	.733	.07				
238	28	34	.622	.755	.15				
239	36	31	.799	.910	.16				
240	1	2	.022	.044	.06				
241	25	17	.555	.377	.18	x			
242	18	17	.400	.377	.02				
243	25	27	.555	.599	.04				
244	32	31	.710	.688	.02				
245	21	25	.466	.555	.10				
246	7	2	.155	.044	.20		x		
247	1	1	.022	.022	.00				
248	18	8	.400	.178	.24		x		
249	34	32	.755	.710	.06				
250	38	41	.844	.910	.11				

APPENDIX D

APPENDIX D

TABLE OF PHI COEFFICIENTS AND SIGNIFICANCE
CROSS VALIDATION SAMPLE

Item	No. True Responses		Proportions			Figures of Significance				
						.11	.14	.17	.23	Value
No.	DO	SI	DO	SI	ϕ	.20	.10	.05	.01	Level
1	33	34	.508	.523	.01					
2	9	6	.139	.092	.08					
3	3	2	.046	.031	.08					
4	36	35	.554	.539	.01					
5	2	2	.031	.031	.00					
6	5	1	.077	.015	.15		x			
7	37	35	.569	.539	.03					
8	35	35	.539	.539	.00					
9	39	35	.600	.539	.06					
10	26	29	.400	.446	.04					
11	11	7	.169	.108	.09					
12	57	61	.877	.939	.13	x				
13	6	12	.092	.185	.13	x				
14	56	53	.862	.815	.06					
15	5	7	.072	.108	.05					
16	28	32	.431	.492	.06					
17	30	32	.462	.492	.03					
18	43	47	.662	.723	.07					
19	30	31	.462	.477	.03					
20	28	31	.431	.477	.05					
21	7	4	.108	.062	.09					

APPENDIX D (Continued)

TABLE OF PHI COEFFICIENTS AND SIGNIFICANCE
CROSS VALIDATION SAMPLE

Item	No. True Responses		Proportions			Figures of Significance				
						.11	.14	.17	.23	Value
No.	DO	SI	DO	SI	ø	.20	.10	.05	.01	Level
22	19	16	.292	.246	.05					
23	13	12	.200	.185	.03					
24	10	10	.154	.154	.00					
25	20	20	.308	.308	.00					
26	18	33	.277	.508	.23				x	
27	47	47	.723	.723	.00					
28	27	21	.415	.323	.10					
29	57	52	.877	.800	.11	x				
30	4	3	.062	.046	.02					
31	44	39	.677	.600	.08					
32	35	36	.539	.554	.01					
33	22	18	.339	.277	.07					
34	44	52	.677	.800	.14		x			
35	41	40	.631	.615	.01					
36	35	33	.536	.508	.03					
37	26	30	.400	.462	.06					
38	48	48	.739	.739	.00					
39	19	29	.292	.446	.17			x		
40	48	52	.739	.800	.07					
41	46	51	.708	.785	.08					
42	59	60	.908	.923	.01					

APPENDIX D (Continued)

TABLE OF PHI COEFFICIENTS AND SIGNIFICANCE
CROSS VALIDATION SAMPLE

Item	No. True Responses		Proportions			Figures of Significance			
						.11	.14	.17	.23 Value
No.	DO	SI	DO	SI	Ø	.20	.10	.05	.01 Level
43	7	3	.108	.046	.11	x			
44	46	44	.708	.677	.03				
45	7	6	.108	.092	.02				
46	4	3	.062	.046	.01				
47	49	53	.754	.815	.09				
48	22	18	.339	.277	.07				
49	38	31	.585	.477	.10				
50	8	6	.123	.092	.05				
51	45	43	.692	.662	.03				
52	62	61	.954	.939	.01				
53	26	27	.400	.415	.02				
54	39	47	.600	.723	.13	x			
55	10	8	.154	.123	.04				
56	32	39	.492	.600	.11	x			
57	15	15	.231	.231	.00				
58	19	19	.291	.291	.00				
59	34	34	.523	.523	.00				
60	43	43	.662	.662	.00				
61	22	27	.339	.415	.08				
62	63	63	.969	.969	.00				
63	37	40	.579	.615	.04				

APPENDIX D (Continued)

TABLE OF PHI COEFFICIENTS AND SIGNIFICANCE
CROSS VALIDATION SAMPLE

Item	No. True Responses		Proportions			Figures of Significance			
						.11	.14	.17	.23 Value
No.	DO	SI	DO	SI	ø	.20	.10	.05	.01
64	32	32	.492	.492	.00				
65	48	39	.739	.600	.15		x		
66	36	44	.554	.677	.13	x			
67	4	10	.062	.154	.15		x		
68	28	31	.439	.477	.05				
69	28	31	.431	.477	.05				
70	50	46	.769	.708	.08				
71	16	8	.246	.123	.18			x	
72	16	21	.246	.323	.08				
73	2	3	.031	.046	.05				
74	43	47	.662	.723	.07				
75	10	20	.154	.308	.19			x	
76	7	11	.108	.169	.09				
77	19	16	.292	.246	.03				
78	18	24	.277	.369	.10				
79	1	4	.015	.062	.10				
80	30	30	.462	.462	.00				
81	47	47	.723	.723	.00				
82	36	36	.554	.554	.00				
83	6	5	.092	.077	.01				
84	17	14	.262	.215	.05				

APPENDIX D (Continued)

TABLE OF PHI COEFFICIENTS AND SIGNIFICANCE
CROSS VALIDATION SAMPLE

Item	No. True Responses		Proportions			Figures of Significance			
						.11	.14	.17	.23 Value
No.	DO	SI	DO	SI	ø	.20	.10	.05	.01 Level
85	46	51	.708	.785	.08				
86	17	13	.262	.200	.07				
87	51	53	.785	.815	.05				
88	47	39	.723	.600	.13	x			
89	28	25	.431	.385	.05				
90	8	11	.123	.169	.07				
91	32	26	.492	.400	.09				
92	31	31	.477	.477	.00				
93	23	14	.354	.215	.14		x		
94	6	4	.092	.062	.06				
95	20	17	.308	.262	.06				
96	38	37	.585	.569	.01				
97	58	58	.892	.892	.00				
98	61	65	.939	1.00	.18			x	
99	36	38	.554	.585	.03				
100	21	12	.323	.185	.16		x		
101	22	39	.339	.600	.26				x
102	18	30	.277	.462	.19			x	
103	27	22	.415	.339	.08				
104	17	11	.262	.169	.11	x			
105	3	1	.046	.015	.08				

APPENDIX D (Continued)

TABLE OF PHI COEFFICIENTS AND SIGNIFICANCE
CROSS VALIDATION SAMPLE

Item	No. True Responses		Proportions			Figures of Significance			
						.11	.14	.17	.23 Value
No.	DO	SI	DO	SI	ø	.20	.10	.05	.01 Level
106	8	6	.123	.092	.05				
107	21	19	.323	.292	.03				
108	38	39	.585	.600	.02				
109	45	45	.692	.692	.00				
110	8	5	.123	.077	.07				
111	33	33	.508	.508	.00				
112	19	12	.292	.185	.13	x			
113	2	3	.031	.046	.05				
114	49	56	.754	.862	.14		x		
115	2	1	.031	.015	.03				
116	8	7	.123	.108	.02				
117	32	26	.492	.400	.09				
118	34	31	.523	.477	.04				
119	31	37	.477	.569	.09				
120	52	49	.800	.754	.06				
121	9	5	.139	.077	.10				
122	2	0	.031	.000	.12	x			
123	10	12	.154	.185	.04				
124	55	57	.846	.877	.04				
125	11	9	.169	.139	.04				
126	17	24	.262	.369	.12	x			

APPENDIX D (Continued)

TABLE OF PHI COEFFICIENTS AND SIGNIFICANCE
CROSS VALIDATION SAMPLE

Item	No. True Responses		Proportions			Figures of Significance				
						.11	.14	.17	.23	Value
No.	DO	SI	DO	SI	ø	.20	.10	.05	.01	Level
127	4	6	.062	.092	.06					
128	43	51	.662	.785	.14		x			
129	16	18	.246	.277	.03					
130	57	51	.877	.785	.13	x				
131	37	29	.569	.446	.12	x				
132	31	29	.477	.446	.03					
133	26	20	.400	.308	.09					
134	27	19	.415	.292	.14		x			
135	52	48	.800	.739	.07					
136	29	31	.446	.477	.03					
137	21	13	.323	.200	.14		x			
138	31	30	.477	.462	.02					
139	7	8	.108	.123	.01					
140	18	20	.277	.308	.03					
141	30	25	.462	.385	.08					
142	8	8	.123	.123	.00					
143	3	6	.046	.092	.06					
144	38	47	.585	.723	.15		x			
145	23	22	.354	.339	.01					
146	22	19	.339	.292	.05					
147	29	29	.446	.446	.00					

APPENDIX D (Continued)

TABLE OF PHI COEFFICIENTS AND SIGNIFICANCE
CROSS VALIDATION SAMPLE

Item	No. True Responses		Proportions			Figures of Significance			
						.11	.14	.17	.23 Value
No.	DO	SI	DO	SI	ø	.20	.10	.05	.01 Level
148	8	8	.123	.123	.00				
149	28	28	.431	.431	.00				
150	36	36	.554	.554	.00				
151	34	30	.523	.462	.06				
152	53	55	.815	.846	.04				
153	42	36	.646	.554	.10				
154	28	33	.431	.508	.08				
155	35	42	.539	.646	.11	x			
156	22	10	.339	.154	.22			x	
157	26	12	.400	.185	.24				x
158	8	2	.123	.031	.17			x	
159	3	4	.046	.062	.01				
160	28	22	.431	.339	.09				
161	15	18	.231	.277	.06				
162	37	35	.569	.539	.03				
163	37	41	.569	.631	.06				
164	40	36	.615	.554	.07				
165	24	29	.369	.446	.08				
166	11	7	.169	.108	.09				
167	51	58	.785	.892	.15		x		
168	26	25	.400	.385	.02				

APPENDIX D (Continued)

TABLE OF PHI COEFFICIENTS AND SIGNIFICANCE
CROSS VALIDATION SAMPLE

Item	No. True Responses		Proportions			Figures of Significance			
						.11	.14	.17	.23 Value
No.	DO	SI	DO	SI	ø	.20	.10	.05	.01 Level
169	53	48	.815	.739	.10				
170	6	2	.092	.031	.13	x			
171	42	52	.646	.800	.17			x	
172	47	43	.723	.662	.07				
173	27	17	.415	.262	.17			x	
174	62	62	.954	.954	.00				
175	17	7	.262	.108	.19			x	
176	10	14	.154	.215	.09				
177	63	62	.969	.954	.05				
178	23	20	.354	.308	.04				
179	16	17	.246	.262	.01				
180	10	10	.154	.154	.00				
181	6	9	.092	.139	.08				
182	28	26	.431	.400	.03				
183	33	31	.508	.477	.03				
184	3	5	.046	.077	.06				
185	30	19	.462	.292	.18			x	
186	43	38	.662	.585	.08				
187	52	56	.800	.862	.08				
188	24	17	.369	.262	.12	x			
189	6	6	.092	.092	.00				

APPENDIX D (Continued)

TABLE OF PHI COEFFICIENTS AND SIGNIFICANCE
CROSS VALIDATION SAMPLE

Item	No. True Responses		Proportions			Figures of Significance				
						.11	.14	.17	.23	Value
No.	DO	SI	DO	SI	ϕ	.20	.10	.05	.01	Level
190	22	19	.339	.292	.05					
191	46	39	.708	.600	.12	x				
192	22	18	.339	.277	.05					
193	16	13	.245	.200	.06					
194	34	41	.523	.631	.01					
195	57	62	.876	.954	.13	x				
196	25	21	.385	.323	.06					
197	27	19	.415	.292	.14		x			
198	35	27	.539	.415	.12	x				
199	15	9	.231	.139	.12	x				
200	25	20	.385	.308	.07					
201	49	52	.754	.800	.06					
202	52	52	.800	.800	.00					
203	15	12	.231	.185	.06					
204	17	26	.262	.400	.15		x			
205	25	19	.385	.292	.10					
206	46	36	.708	.554	.17			x		
207	63	60	.969	.923	.11	x				
208	41	45	.631	.692	.06					
209	50	58	.769	.892	.16		x			
210	17	11	.262	.169	.11	x				

APPENDIX D (Continued)

TABLE OF PHI COEFFICIENTS AND SIGNIFICANCE
CROSS VALIDATION SAMPLE

Item	No. True Responses		Proportions			Figures of Significance			
						.11	.14	.17	.23 Value
No.	DO	SI	DO	SI	ø	.20	.10	.05	.01 Level
211	23	13	.354	.200	.17			x	
212	19	13	.292	.200	.11	x			
213	13	12	.200	.185	.03				
214	29	27	.446	.415	.03				
215	51	55	.785	.846	.09				
216	18	15	.277	.231	.06				
217	55	57	.846	.877	.04				
218	16	7	.246	.108	.18			x	
219	23	15	.354	.231	.13	x			
220	35	41	.539	.631	.09				
221	4	3	.062	.046	.01				
222	16	13	.246	.200	.06				
223	35	36	.539	.554	.01				
224	5	4	.077	.062	.04				
225	32	23	.492	.354	.14		x		
226	59	55	.908	.846	.09				
227	24	23	.369	.354	.01				
228	7	2	.108	.031	.16		x		
229	15	11	.231	.169	.08				
230	39	37	.600	.569	.03				
231	5	5	.077	.077	.00				

APPENDIX D (Continued)

TABLE OF PHI COEFFICIENTS AND SIGNIFICANCE
CROSS VALIDATION SAMPLE

Item	No. True Responses		Proportions			Figures of Significance				
						.11	.14	.17	.23	Value
No.	DO	SI	DO	SI	ϕ	.20	.10	.05	.01	Level
232	30	37	.462	.569	.11	x				
233	8	4	.123	.062	.11	x				
234	27	25	.415	.385	.04					
235	44	44	.677	.677	.00					
236	61	56	.939	.862	.13	x				
237	33	38	.508	.585	.07					
238	42	45	.646	.692	.04					
239	59	51	.908	.785	.18			x		
240	4	7	.062	.108	.09					
241	24	24	.369	.369	.00					
242	20	29	.308	.406	.10					
243	37	36	.569	.554	.02					
244	43	44	.668	.677	.02					
245	23	27	.352	.415	.08					
246	6	4	.092	.062	.06					
247	1	1	.015	.015	.00					
248	21	15	.323	.231	.10					
249	34	42	.523	.646	.13	x				
250	54	60	.831	.923	.14		x			

APPENDIX E

APPENDIX E

CONTENT OF COMMON ITEMS SCALE .01 - .20

6. My father changes jobs frequently.
12. I would like a job where I would be working with people rather than machines.
34. The students in my class like me.
43. Even though I do as well as I can, my grades are always below average.
67. Most of the other students have better clothes than I do.
71. Other students seem to be happier than I am.
114. I have never had to repeat a grade in school.
122. I only came to college because most of my friends were going to college.
126. I dislike to talk in a group or in a class.
128. I would rather watch sporting events on television than a serious play.
131. I find it easy to speak in a group where I am the center of attention.
156. I would rather play tennis than baseball or football.
170. I was sent out of class frequently in high school because of disagreement with the teacher.
173. I have never learned how to use the library effectively.
175. Counting my parents and me, there are more than seven in our family.
185. My English skills are very good.
188. I like classes where we study theory better than those where we practice an activity.
191. My father likes to read books.
195. I would rather be here in college than in military service.
198. Our family subscribes to at least five magazines.
199. Sometimes I want to say things just to hurt people.
207. I am not going to get married until I finish college.
209. I usually do what I am expected to do.
211. My parents still consider me to be a child.
236. I would rather be here in college than at home working in a job.
239. I like college.

APPENDIX F

APPENDIX F

X Axis - College Interest Inventory .05 Developed Scale

Y Axis - California Psychological Inventory So Scale

Score	12-13	14-15	16-17	18-19	20-21	22-23	24-25	26-27	28-29	30-31	32-33	34-35	Freq
45-47			|	|	|		|						4
42-44		|	|	||	||||	||	|	||		|			14
39-41			|	|||	||	||	||||	||	||				16
36-38		|	|||	|| 𝍸	|||	|	||||	||		|			22
33-35			|	||	𝍸	||||	||	||	|	||	|		20
30-32		|		||	|	|| 𝍸	|	|	|	|			15
27-29				|	|		||||	|	|				8
24-26						||	|				|		4
21-23						||		|					3
18-20					|								1
15-17						|			|				2
12-14													0
9-11						|						1
6-8													0
Freq.	0	3	7	18	18	22	18	11	6	5	2	0	110

r = -.22

APPENDIX F (Continued)

X Axis College Interest Inventory .05 Developed Scale

Y Axis - California Psychological Inventory Sc Scale

Score	12-13	14-15	16-17	18-19	20-21	22-23	24-25	26-27	28-29	30-31	32-33	34-35	Freq
45-47													0
42-44			I				I						2
39-41					II		I						3
36-38		I	II			I		I		I			6
33-35			I	I	II	I	I						6
30-32		I		𝍸 II	II	I		I		I			13
27-29			I	III	III	III	I	II	I	I			15
24-26		I	I	II	I	𝍸	II	I	II				15
21-23			I	III	IIII	II	IIII	𝍸	II				21
18-20				II		II	II	I		I	I		9
15-17					II	𝍸	IIII		I	I			13
12-14					II	II	II				I		7
9-11													0
6-8													0
Freq.	0	3	7	18	18	22	18	11	6	5	2	0	110

r = -.29

APPENDIX F (Continued)

X Axis College Interest Inventory .05 Developed Scale

Y Axis - California Psychological Inventory Ac Scale

Score	12-13	14-15	16-17	18-19	20-21	22-23	24-25	26-27	28-29	30-31	32-33	34-35	Freq
45-47													0
42-44													0
39-41													0
36-38													0
33-35					𝍷𝍷		𝍷𝍷						4
30-32			𝍷	𝍸	𝍷𝍷𝍷	𝍷	𝍷						11
27-29		𝍷	𝍸	𝍷𝍷𝍷𝍷	𝍷𝍷	𝍷𝍷𝍷	𝍷𝍷𝍷𝍷	𝍷𝍷𝍷	𝍷𝍷	𝍷𝍷	𝍷		27
24-26				𝍸	𝍸	𝍷𝍷𝍷	𝍷𝍷𝍷𝍷	𝍷𝍷𝍷		𝍷𝍷			22
21-23		𝍷	𝍷	𝍷𝍷	𝍷𝍷𝍷𝍷	𝍷𝍷 𝍸	𝍷𝍷	𝍷𝍷𝍷	𝍷				21
18-20		𝍷			𝍷	𝍷𝍷𝍷𝍷	𝍷𝍷𝍷	𝍷𝍷	𝍷	𝍷			13
15-17				𝍷𝍷		𝍷𝍷	𝍷		𝍷		𝍷		7
12-14					𝍷	𝍷𝍷	𝍷						4
9-11													0
6-8									𝍷				1
Freq.	0	3	7	18	18	22	18	11	6	5	2	0	110

r = -.17

X Axis - College Interest Inventory .10 Developed Scale

Y Axis California Psychological Inventory So Scale

Scale	17-18	19-20	21-22	23-24	25-26	27-28	29-30	31-32	33-34	35-36	37-38	39-40	Freq
45-47			ǀǀ	ǀ	ǀ	ǀ	ǀ						6
42-44		ǀ	ǀ	ǀ	ǀ	ǀǀǀ	ǀǀǀ	ǀ	ǀ				12
39-41			ǀ	ǀǀǀ	ǀ	ǀǀ	ǀǀǀ	ǀǀǀ		ǀ	ǀǀ		16
36-38	ǀ	ǀ	ǀǀǀ	ǀǀǀ	ǀǀ 卌	ǀ	ǀǀ	ǀǀǀ				ǀ	22
33-35			ǀ	ǀǀ	ǀǀǀǀ	卌	ǀ	ǀ	ǀǀǀ		ǀ	ǀǀ	20
30-32		ǀ		ǀǀ	ǀ	ǀǀǀ	卌	ǀǀ			ǀ		15
27-29						ǀǀǀ	ǀǀ		ǀ	ǀ	ǀ		8
24-26					ǀ	ǀ	ǀ			ǀ			4
21-23							ǀǀ				ǀ		3
18-20							ǀ						1
15-17							ǀ			ǀ			2
12-14													0
9-11					ǀ								1
6-8													0
Freq.	1	3	8	12	17	19	22	10	5	4	6	3	110

r = -.23

APPENDIX F (Continued)

X Axis - College Interest Inventory .10 Developed Scale

Y Axis - California Psychological Inventory Sc Scale

Score	17-18	19-20	21-22	23-24	25-26	27-28	29-30	31-32	33-34	35-36	37-38	39-40	Freq.
45-47													0
42-44			|				|						2
39-41					|	|		|					3
36-38		|	||		|			|	|				6
33-35			|		||	|	||						6
30-32			|	𝍸	||	||	||		|				13
27-29	|		|	||	||	||||	||	|	|			|	15
24-26		||		|	|||	||||	||	||			|		15
21-23			||	||	|	||||	𝍸		||	|||	||		21
18-20				|	|	||		||			|	||	9
15-17					|||		| 𝍸	||			||		13
12-14				|	|	|	||	|		|			7
9-11													0
6-8													0
Freq.	1	3	8	12	17	19	22	10	5	4	6	3	110

r = -.31

APPENDIX F (Continued)

X Axis - College Interest Inventory .10 Developed Scale

Y Axis - California Psychological Inventory Ac Scale

Scale	17-18	19-20	21-22	23-24	25-26	27-28	29-30	31-32	33-34	35-36	37-38	39-40	Freq
45-47													0
42-44													0
39-41													0
36-38													0
33-35			𝍷			𝍷𝍷	𝍷						4
30-32			𝍷	𝍷𝍷	𝍸𝍷		𝍷𝍷						11
27-29		𝍷	𝍸	𝍷𝍷𝍷𝍷	𝍷	𝍸	𝍷𝍷	𝍷𝍷𝍷	𝍷𝍷𝍷	𝍷		𝍷𝍷	27
24-26	𝍷			𝍷𝍷𝍷𝍷	𝍷	𝍸𝍷	𝍷𝍷𝍷𝍷	𝍷𝍷𝍷	𝍷	𝍷	𝍷𝍷		23
21-23		𝍷𝍷		𝍷	𝍸	𝍷𝍷𝍷	𝍸𝍷𝍷	𝍷		𝍷			20
18-20			𝍷		𝍷𝍷	𝍷	𝍷𝍷𝍷	𝍷		𝍷	𝍷𝍷𝍷	𝍷	13
15-17				𝍷		𝍷𝍷	𝍷𝍷	𝍷	𝍷				7
12-14					𝍷𝍷		𝍷	𝍷					4
9-11													0
6-8											𝍷		1
Freq.	1	3	8	12	17	19	22	10	5	4	6	3	110

r = -.24

VITA

1940-1962	United States Army		
1952-1955	University of Georgia		
1959-	University of Georgia	B.S.	June 1959
1959-1962	Assistant Professor Military Science, Boston College, Chestnut Hill, Massachusetts		
1959-1962	Boston College Graduate School of Arts and Sciences, Department of Education	M. Ed	June 1962
1962-1965	Director of Counseling and Placement, Assistant Professor, St. Francis College, Biddeford, Maine		
1965-1966	Director of Counseling, Assistant Professor, St. Francis College, Biddeford, Maine		
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1962-1967	Boston College Graduate School of Arts and Sciences - Doctoral Studies		